



# International Abstract of Surgery

SUPPLEMENTARY TO

Surgery, Gynecology and Obstetrics

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## ABSTRACT EDITORS

MICHAEL L. MASON AND SUMNER L. KOCH

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*Supplementary to*  
**Surgery, Gynecology and Obstetrics**

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LORD MOYNIHAN, K.C.M.G., C.B., Leeds  
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MICHAEL L. MASON and SUMNER L. KOCH

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## CONTENTS

I	Index of Abstracts of Current Literature	III-VI
II	Authors of Articles Abstracted	VIII
III	Collective Review	1-15
IV	Abstracts of Current Literature	16-63
V	Bibliography of Current Literature	64-88

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# CONTENTS—JANUARY, 1935

## COLLECTIVE REVIEW

GASTRODUODENAL ULCERATIVE DISEASE—A Review of the 1933 Literature *Samuel J. Fogelson, M.D., M.S., F.A.C.S., Chicago* 1

## ABSTRACTS OF CURRENT LITERATURE

### SURGERY OF THE HEAD AND NECK

#### Head

HINTZE, A. Benign and Malignant Parotid Tumors and Their Amenability to Cure 16

RUSSELL, W. R. The After Effects of Head Injury 23

#### Eye

O'DAY, K. Operations for the Relief of Trichiasis and Cicatricial Entropion 17

VILLEGAS, R. R., and DANIEL, C. S. Neuroinoma of the Orbit 18

SMOLEROFF, J. W. and AGATSTON, S. A. Metastatic Carcinoma of the Retina. Report of a Case, with Pathological Observations 18

CATTELL, R. B. Eye Complications in Exophthalmic Goiter 20

#### Ear

RODGER, T. R. Mucopurulent Tubotympanic Infections 18

KUBIE, L. S. Forced Drainage for the Treatment of Meningitis Secondary to Ear and Sinus Infections 18

#### Nose and Sinuses

COOPER, K. G. Plasmocytoma and Rhabdomyoma of the Paranasal Sinuses. Pathological and Surgical Considerations, Report of Cases 19

#### Mouth

PERUSSIA, F. Radiotherapy of Cancer of the Mouth 19

#### Pharynx

BAILEY, C. W. Modern Surgery in Diphtheria, Observations on 6,011 Cases 20

#### Neck

MAES, U., BOYCE, F. F., and McFETRIDGE, E. M. Hyperthyroidism in the Negro, with an Analysis of Seventy-Three Cases 20

CATTELL, R. B. Eye Complications in Exophthalmic Goiter 20

ROUSSY, G., HUGUENIN, R., and WELT, H. The Histological Structure of the Thyroid Remaining After Cure of Basedow's Disease by Subtotal Thyroidectomy 21

ZUPFINGER, A., and ROHRFF, C. The Clinical Aspects and Treatment of Struma Maligna. A Report on 101 Cases Treated in the Period from 1918 to 1933 21

VAN POOLLE, G. McD. Tuberculosis of the Larynx 22

### SURGERY OF THE NERVOUS SYSTEM

#### Brain and Its Coverings, Cranial Nerves

RUSSELL, W. R. The After Effects of Head Injury 23

PURCH, P., and STUILL, L. Adenomata of the Hypophysis. The Roentgenological Appearance of the Sella Turcica 23

ANDSON, A. W. The Operability of Brain Tumors 23

#### Spinal Cord and Its Coverings

STERN, E. L. The Relief of Intractable Pain by the Intraspinal Injection of Alcohol 24

LEE, A. The Surgical Treatment of Syngomyelia 24

#### Peripheral Nerves

BERGSTRAND, H. A Malignant Tumor of the Left Tibial Nerve 25

### SURGERY OF THE CHEST

#### Chest Wall and Breast

TASSI, D. Acute Purulent Mastitis During Lactation 26

MOULONGUET DOLÉRIS, P. The Diagnosis of Cancer of the Breast 26

#### Trachea, Lungs, and Pleura

POTTINGER, F. M. Non-Operative Versus Operative Measures in the Treatment of Pulmonary Tuberculosis 26

WOOD, H. G. Cystic Disease of the Lungs 27

HEUER, G. J. The Development of Lobectomy and Pneumectomy in Man 27

#### Heart and Pericardium

CUADRADO, F. Wounds of the Heart 28

LASCANO, J. C., and VALENZUELA, J. R. The Clinical Syndrome of Short Neck and a Very Rare Malformation of the Heart in a Newborn Infant 61

## INTERNATIONAL ABSTRACT OF SURGERY

## Miscellaneous

- COLETTI, D. A. Traumatic Laceration of the Diaphragm. Hernia of the Stomach and Spleen.  
 CHAKROBERTY and DARMALLACQ. Intercoastal Hernia of the Large Intestine of Spontaneous Origin.  
 HARRINGTON, S. W. Surgical Treatment in Fourteen Cases of Mediastinal or Intrathoracic Peritoneal Fibrosarcoma.

- MONTGOMERY, J. B. and PARKER, J. T. J. The Results of Postoperative X-Ray Therapy in Carcinoma of the Ovary. A Series of Twenty Two Cases.

## Miscellaneous

- SELDEN, M. G. and LEVINE, M. K. Blood Toxins in Certain Gynecological Conditions.  
 MARION, G. The Formation of Continent Urethra in Women and the Use of This Operation in Entropy of the Bladder.

## SURGERY OF THE ABDOMEN

- Abdominal Wall and Peritoneum  
 SCHWARTZ, W. Late Results of Radical Operation for Inguinal Hernia in the Male.  
 MEYER, S. H. Rile Peritonitis.  
 CONTANTINI, H. and MARILL, R. The Advantages of Large Muscle-Splitting Incision in Surgery of the Plank.  
 PASCHOW, H. The Treatment of Suppurative Peritonitis. Introduction of the Use of Ultraviolet Light in Operative Surgery.

## OBSTETRICS

- Pregnancy and Its Complications  
 RUCKER, R., ROBERTS, R. E. and RAYMOND, W. R., VANDERKAM, K. and Others. Discussion on the Physiology and Pathology of the Pelvic Joints in Relation to Childbearing.  
 GUERIN, N. Active Expression of the Uterus, According to MARION, and Its Value in the Physiology of Pregnancy.

## Gastro-Intestinal Tract

- SEABY, S. The Clinical Aspects of Tuberculosis of the Stomach.  
 SCHWARTZ, E. A Study on the Cause of Death in High Intestinal Obstruction. Observations on Chills, Urine, and Water.  
 GROSS, E. Duodenal Fistula and in Particular Case of Duodenal Fistula as Late Sequel of Hepaticcholecystectomy and Cholecystectomy for Stones. Duodenostomy with Gastroplasty Case.  
 LARSON, L. M. and NORDLAND, M. Malignant Tumors of the Large Intestine.  
 McWILLIAMS, G. L. Acute Diverticulitis of the Cecum. Right Sided Symptoms with Diverticulitis of the Sigmoid.  
 ANDRELL, A. Investigation of Flaccidity of the Cecum.  
 EDWARDS, H. C. Diverticula of the Ventriculus Appendix.  
 D'ARNOY, R. and FINE, A. Pseudocystoma Perforations of Appendicular Organs.  
 VOLKOWITZ, F. My Experiences with High Rectal Amputation.

## Labor and Its Complications

- CATALAN, V. and SERRA, E. A Note on the Pathological Anatomy and the Pathogenesis of Edema of the Cervix Uteri During Labor.  
 GONZALEZ, A. and TAMBO, H. S. A Study Based on Twenty Four Years of Cesarean Section.  
 LE LONGER and MATTEI. Twenty Six Obstetrical Anesthetics Induced with Evipan Sodium in the Maternity Hospital of Port Royal.  
 Puerperium and Its Complications  
 TAMM, D. Acute Puerperal Mastitis During Lactation.

## GENITO-URINARY SURGERY

- Adrenal, Kidney and Ureter  
 FUCHS, F. The Relation of the Physiology of the Upper Urinary Tract to Excretory Urography.  
 GILBERT, J. B. and MACMILLAN, S. F. Cancer of the Kidney.  
 MCKENNA, A. Ureteric

## Bladder, Urethra, and Penis

- MARION, G. The Formation of Continent U/ in Women and the Use of This Oper/ Entropy of the Bladder.  
 FRANCHINI, E. Technical Note on of Foreign Body from the Natural Route.

## Genital Organs

- MOORE, A. C. and SAMPLE, J. E. Continence of the Prostatectomy.

## GYNECOLOGY

- Uterus  
 MARION, J. V. Probes in the Treatment of Abnormal Uterine Bleeding.  
 FRANKLY, L. E. Radium Therapy in Uterine Hemorrhages of Benign Origin.  
 SMITH, F. R. The Incidence of Vaginal Fistula in Patients with Carcinoma of the Cervix.  
 Adnexal and Peristerine Conditions  
 KAM, M. E. and NOWAT, S. Primary Carcinoma of the Fallopian Tube.

- FRANCESCHI, E A Contribution to the Study of True Prostatic Calculi
- JAMES, T G I, and MATHESON, N M Observations on Carcinoma of the Prostate
- MENTZ, E R, and Smith, G G Autopsy Findings in 100 Cases of Prostatic Cancer
- ABERLE, S B D, and JENKINS, R H. Undescended Testes in Man and Rhesus Monkeys Treated with the Anterior Pituitary-Like Principle from the Urine of Pregnancy
- RUBINSTEIN, H S The Production of Testicular Descent with the Water Soluble (Anterior Pituitary-Like) Fraction of Pregnancy Urine
- HENLINE, R B The Differential Diagnosis and Treatment of Tumors of the Testicle
- CECCARELLI, G Malignant Tumors of the Testicle Histopathological and Clinical Considerations
- ROBERTSON, J P, and GILBERT J B Coexistent Cancer and Tuberculosis of the Testicle Case Report and Complete Review of the Literature
- GILLIARD, A A Contribution on the Radiotherapy of Seminomata

## SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

- Conditions of the Bones, Joints, Muscles, Tendons, Etc
- FRASER, J Acute Osteomyelitis
- GAMBOÁ, M Sclerosing Osteomyelitis
- BERNARDINI, R Roentgen Examination of Brodie's Chronic Bone Abscess
- BOYOLA, A. The Clinical, Roentgenological, and Histological Picture of Dyschondroplasia
- MAURO, M. Arthritis in Hemophilia A Contribution on Its Pathogenesis, Clinical Aspects, and Treatment
- MILCH, H So-Called "Primary" Tuberculosis of Muscle
- BRAVO Y DIAZ CAÑEDO Malacias of the Navicular Bone of the Wrist
- ZAKPETTI, M Acute Osteomyelitis of the Ribs Caused by Ordinary Pus Cocc
- UHRMACHER, F Variations of the Skeleton of the Foot as a Basis of Foot Disorders
- Surgery of the Bones, Joints, Muscles, Tendons, Etc
- MILCH, H., and RAISMAN, V Arthrotomy of the Knee Joint
- Phary
- BAILEY, es and Dislocations
- Obsc C R. The Healing of Fractures, Its Influence on the Choice of Methods of Treatment
- Neck T, COPENHAVER, W, and AREY, L
- MAES, U, BOYOLA, ve Study of the Rate of Healing in Hyperthyroidism. Normal Rate of Healing of Seventy-Three
- MOORE, J M The Influence of Calcium and Phosphorus of Fractures, An Experimental
- ROUSSY, G, HUGUE
- Histological Study Subsequent Changes in the After Cure of Dislocated Hip Reduced by the Thyroidectomy Method

## SURGERY OF BLOOD AND LYMPH SYSTEMS

- 45 Blood Vessels
- 45 OCHSNER, A., and MAHORNER, H The Comparative Value of Intravenous Sclerosing Substances
- 45 PICCAGLI, G Traumatic Thrombosis of the Right Axillary Vein
- Blood, Transfusion
- 45 SERDUKOFF, M G, and LEVISAIA, M K Blood Transfusion in Certain Gynecological Conditions
- 46 MAURO M Arthritis in Hemophilia A Contribution on Its Pathogenesis, Clinical Aspects, and Treatment
- 46 NORDENSON, N G Quantitative Histological Studies of the Normal and Pathological Bone Marrow
- 47 MALIJSEV, B The Pathologico-Anatomical Changes in the Organs Following Hemolytic Shock
- 47 WEDDELL, A G, and GALE, H E D Changes in the Blood Sugar Level Associated with Surgical Operations

## SURGICAL TECHNIQUE

### Operative Surgery and Technique, Postoperative Treatment

- COLLER, F A, and MADDOCK, W G Water Balance in Surgical Conditions
- Koch, S L Burn Contractures of the Axilla
- Anæsthesia
- 49 LE LORIER and MAYER Twenty-Six Obstetrical Anæsthesias Induced with Evipan Sodium in the Maternity Hospital of Port Royal

## PHYSICO-CHEMICAL METHODS IN SURGERY

- Roentgenology
- 50 PERUSSIA, F Radiotherapy of Cancer of the Mouth
- 51 PUECH, P, and STUHL, L Adenomata of the Hypophysis The Roentgenological Appearance of the Sella Turcica
- 51 MONTGOMERY, J B, and FARRELL, J T, JR. The Results of Postoperative X-Ray Therapy in Carcinoma of the Ovary A Series of Twenty-Two Cases
- 52 FUCHS, F The Relation of the Physiology of the Upper Urinary Tract to Elimination Urography
- BERNARDINI, R. Roentgen Examination of Brodie's Chronic Bone Abscess
- 52 BONOLA, A The Clinical, Roentgenological, and Histological Picture of Dyschondroplasia
- 52 BUISSON, M Combination of Roentgen Therapy and Moist-Heat Therapy in Lupus Vulgaris
- GILLIARD, A A Contribution on the Radiotherapy of Seminomata
- ALBERTINI, A. VON The Presence of Microcytes in Round Celled Sarcomata as Histological Evidence of the Sensitivity of These Tumors to Irradiation
- 53 MOLESWORTH, E H X Ray Necrosis

**Radium**

FRANKS, L. E.: Radium Therapy in Uterine Hemorrhages of Benign Origin

37

**Miscellaneous**

PARSONS, H.: The Treatment of Suppurative Pilonitis. Introduction of the Use of Ultraviolet Light in Operative Surgery

60

**MISCELLANEOUS**

Clinical Entities—General Physiological Conditions

LASCANO, J. C., and VALERDELLA, J. R.: The Clinical Syndrome of Short Neck and Very Rare Malformation of the Heart in a Newborn Infant

6

ONASSO, A.: Sacrococcygeal Chordoma

6

WERNER, A. G., and GALT, H. E. D.: Changes in the Blood-Sugar Level Associated with Surgical Operations

6

**Testes Glands**

PEREZ, E.: A Case of Extratestal Chorionepithelioma in a Male with Positive Anterior Pituitary Lobe Reaction

63

**Surgical Pathology and Diagnosis**

COTLER, C. W. J.: Errors of Surgical Diagnosis. A Study of the Records of the First Surgical Division of the Roosevelt Hospital Covering Period of Three Years

62

## BIBLIOGRAPHY

## Surgery of the Head and Neck

Head  
Eye  
Ear  
Nose and Sinuses  
Mouth  
Pharynx.  
Neck

64	Adrenal, Kidney, and Ureter	78
64	Bladder, Urethra, and Penis	79
65	Genital Organs	79
65	Miscellaneous	79

## Surgery of the Nervous System

Brain and Its Covering, Cranial Nerves  
Spinal Cord and Its Coverings  
Peripheral Nerves  
Sympathetic Nerves  
Miscellaneous

67	Surgery of the Bones, Joints, Muscles, Tendons, Etc	80
68	Surgery of the Bones, Joints, Muscles, Tendons, Etc.	82
68	Fractures and Dislocations	82
68	Orthopedics in General.	83

## Surgery of the Chest

Chest Wall and Breast  
Trachea, Lungs, and Pleura  
Heart and Pericardium  
Esophagus and Mediastinum  
Miscellaneous

68	Surgery of the Blood and Lymph Systems	
68	Blood Vessels	83
68	Blood, Transfusion	84
69	Reticulo-Endothelial System	84
69	Lymph Glands and Lymphatic Vessels	84

## Surgery of the Abdomen

Abdominal Wall and Peritoneum  
Gastro-Intestinal Tract.  
Liver, Gall Bladder, Pancreas, and Spleen  
Miscellaneous

70	Surgical Technique	
70	Operative Surgery and Technique, Postoperative Treatment.	84
73	Antiseptic Surgery, Treatment of Wounds and Infections	85
74	Anesthesia	85
74	Surgical Instruments and Apparatus	86

## Gynecology

Uterus  
Adnexal and Peruterine Conditions  
External Genitalia  
Miscellaneous

74	Physicochemical Methods in Surgery	
75	Roentgenology	86
75	Radium.	87
75	Miscellaneous	87

## Obstetrics

Pregnancy and Its Complications.  
Labor and Its Complications.  
Puerperium and Its Complications  
Newborn  
Miscellaneous

76	Miscellaneous	
76	Clinical Entities—General Physiological Conditions	87
77	General Bacterial, Protozoan, and Parasitic Infections	88
77	Ductless Glands	88
77	Surgical Pathology and Diagnosis	88

## AUTHORS OF ARTICLES ABSTRACTED

- Abernethy, S. B. D. 43  
 Adams, A. W. 3  
 Agnieton, S. A. 8  
 Albertini, A. von, 59  
 Asch, A. 35  
 Ary, L. 13  
 Bailey, C. W. 9  
 Bergstrand, H. 3  
 Bernardini, R., 48  
 Bonola, A., 40  
 Boyce, F. F. 88  
 Brava y Deas Calcedo, 30  
 Brastow, W. R., 40  
 Brooks, R., 40  
 Deleone, M. 59  
 Cathala, V., 41  
 Caffall, R. B., 40  
 Courault, G. 47  
 Charbonnet, 40  
 Chetia, D. A. 43  
 Coffey, F. A., 57  
 Cooper, K. G., 9  
 Copestaver, W. 41  
 Constantini, H. 3  
 Conzando, F. 43  
 Culler, C. W. J. 62  
 Deane, C. S. 18  
 Dermailaco, 40  
 D'Amoy, R. 43  
 Edwards, H. C. 45  
 Farrell, J. T., Jr., 23  
 Faceter, E. 61  
 Fine, A., 35  
 Fogelson, S. J.  
 Francischelli, E. 44, 43  
 Fraser, J. 48  
 Fuchs, P. 44  
 Gale, H. E. D. 61  
 Gambod, M. 48  
 Glasch, M., 40  
 Gilbert, J. B. 44, 47  
 Gilbard, A. 59  
 Gumpfinger, A., 43  
 Goyle, E. 31  
 Haldeeman, K. O., 53  
 Harrington, S. W. 49  
 Harrison, R. B. 40  
 Hasser, G. J. 37  
 Hinton, A. 16  
 Hagema, R.,  
 James, T. G. I. 43  
 Jenkins, R. H., 41  
 Kahn, M. E. 37  
 Koch, S. L. 38  
 Kistner, L. S. 18  
 Lagomarcino, E. H. 53  
 Larson, L. M. 53  
 Lasciano, J. C., 6  
 Le Loner, 43  
 Levinsky, M. K. 33  
 Ley, A., 44  
 Macmillan, S. F. 44  
 Macdowell, W. O. 57  
 Mera, U. 40  
 Mahanar, H., 54  
 Mashkov, B. 55  
 Manik, R., 3  
 Maroon, G. 30  
 Matheson, M. M. 45  
 Maers, M., 30  
 Mayer, 43  
 McIntosh, Y. M. 30  
 McWhorter, G. L. 34  
 Meigs, J. V. 37  
 Meisner, S. H. 3  
 Mich, H. 30, 1  
 Minis, E. R., 45  
 Miesworth, E. H. 59  
 Montgomery, J. B. 38  
 Moore, J. M., 41  
 Moon, A. C. 44  
 Mostkharmsky, A., 44  
 Mookherjee-Dutta, P. 46  
 Murray, C. R., 43  
 Mordenson, N. O. 55  
 Mordland, M. 53  
 Morris, S. 37  
 Oschner, A. 34  
 Odono, A. 6  
 O'Day, K. 7  
 Paschard, H., 66  
 Pernath, F. 9  
 Peyton, W. T. 3  
 Pissard, L. E. 37  
 Porcagh, O., 54  
 Pottinger, F. M. 46  
 Pouch, P. 4  
 Ralness, V., 4  
 Roberts, R. X., 40  
 Robertson, J. P. 47  
 Rodger, T. R. 18  
 Raker, C. 31  
 Rousey, G. 4  
 Robinson, H. S. 48  
 Russell, W. R. 3  
 Schaefer, W. 30  
 Schneider, E., 32  
 Seaple, J. E. 44  
 Serdukas, M. G. 38  
 Seydel, S. 43  
 Smith, F. R. 37  
 Smith, G. O. 43  
 Soslakoff, J. W. 3  
 Stern, E. L. 24  
 Stahl, L. 3  
 Sweeney, S., 1  
 Tard, D. 46  
 Tamsen, S., 45  
 Ullrich, F., 37  
 Valmachi, J. R. 6  
 Van Hook, O. McD. 23  
 Vaughan, K., 40  
 Villegas, R. R., 18  
 Veecker, F. 35  
 Weddell, A. G. 61  
 Weiss, H.  
 Wood, H. G. 37  
 Zampetti, M. 31  
 Zappinger, A.

# INTERNATIONAL ABSTRACT OF SURGERY

JANUARY, 1935

## COLLECTIVE REVIEW

### GASTRODUODENAL ULCERATIVE DISEASE—A REVIEW OF THE 1933 LITERATURE

SAMUEL J FOGELSON, M D, M S, F A C S

From Department of Experimental Surgery, Northwestern University Medical School

TO a major degree the extensive literature of 1933 on gastroduodenal ulcerative disease consists of an evaluation of results obtained during the last five or more years from particular surgical procedures. A number of surgeons compare their results with those obtained with various types of operations used in the past. Many valuable conclusions were arrived at from these critical analyses. The information gained from the comparisons with regard to the mortality and the morbidity, the degree of success or failure, may be coordinated so that one interested in the subject may obtain practical guidance in the surgical therapy of gastroduodenal ulceration.

This guidance is of special value when it is based on the experience of such men as von Eiselsberg (27), Leriche (66), von Haberer (46), Pribram (81), Finsterer (33), Konjetzny (62), Hurst (57), Babkin (5), Ivy (58), and other surgeons and investigators who placed the treatment of gastroduodenal ulceration upon a scientific basis and are now reviewing their results so that a more effective surgical therapeutics may be evolved.

It is unfortunate that there should still persist marked differences of opinion not only as to the type of surgical intervention, but also as to the proper time for intervention. On the basis of this divergence of opinion the schools of therapy may be divided into the radical and the conservative. The radical school of surgical therapy is of Mid-European origin and includes most surgeons of Continental Europe. The conservative school is represented by English and American clinicians.

The problem of deciding when and what surgical intervention is indicated is difficult especially because both schools report excellent end-results. Conservative clinicians condemn radical surgery as being associated with too great a mortality while radical clinicians claim that in cases treated by conservative surgery the incidence of failure and recurrence is excessive. It is possible that the difference in the results of the 2 schools may be explained by a difference in the types of lesions treated and in the social status of the patients, which latter has an influence on the postoperative dietary. However, if the entire 1933 output of literature may be evaluated without a preformed opinion, it becomes apparent that, without as yet any marked uniformity of opinion, both schools are approaching in practice a mid-ground. The radical surgeon is perhaps becoming less radical and the conservative surgeon has learned that in properly selected cases radical surgery is ultimately truly conservative.

Von Haberer, one of the foremost exponents of radical surgery in the treatment of gastroduodenal ulcerative disease, has published 2 extremely valuable articles. In one (46) he describes his technique of gastric resection and in the other (44) he considers surgical therapy in general, emphasizing the goal to be achieved by resection and reporting his results.

The article on technique describes his method of procedure which was developed in 2,788 cases of gastric resection in which a Billroth I operation was done 1,799 times, the Billroth II operation



## INTERNATIONAL ABSTRACT OF SURGERY

881 times, and the ulcer resection 138 times. Of the 1,799 cases in which the Billroth I operation was performed an end-to-end anastomosis between the stomach and duodenum was done in 1,572 and an end-to-side anastomosis in 227. Von Haberer considers the Billroth I method the operation of choice. He occasionally modifies it into a terminolateral anastomosis in which the end of the stomach is anastomosed to the pars descendens duodeni. When the Billroth I resection does not seem feasible, he performs the Billroth II resection. This is a terminolateral anastomosis (the end of the stomach into the side of the jejunum) preferably antecolic, with the addition of Braun's entero-anastomosis. Occasionally the Billroth II operation is performed by the retrocolic route with the use of the jejunum.

After ligation of the blood vessels and separation of adhesions, the ulcer if penetrating is carefully separated from the adjacent organ into which it has penetrated. The duodenum is then mobilized and the duodenal blood vessels are ligated. Extreme care is taken to prevent injury to the pancreas. If the bed of the ulcer consists of the pancreas, the stomach or duodenum is dissected free with a cautery and the exposed ulcer bed is mobilized. To be certain that an ulcer in the posterior duodenal wall is not overlooked, the use of clamps on the duodenum is avoided. Healthy duodenal mucosa is essential to the Billroth I method of resection.

Many other essential details of technique are described and emphasis is placed upon the hemostatic row of sutures ligating the vessels in the gastric submucosa. The stoma in this Billroth I anastomosis should be at least a fingerbreadth in diameter which in von Haberer's opinion is adequate. A somewhat similar technique is used in the Billroth II operation.

It is interesting to note the emphasis placed upon the type of anesthesia. Whenever possible, some form of lumbar or spinal anesthesia is used. This may be supplemented with block anesthesia of the abdominal wall. Splanchnic anesthesia is supplemented by the intra-cous injection of cyanin.

In discussing his results and the factors which guide him in the selection of the type of operation for each case, von Haberer says that, in his opinion, surgical therapy should be resorted to only in cases which do not respond to conservative measures. Jejunostomy as well as local excision of the ulcer has been abandoned. The best surgical therapy consists of a resection, preferably an extensive one including the pylorus and the antrum. The aim of so extensive a resection is to eliminat-

the "so-called" chemical phase of hydrochloric acid secretion which, in von Haberer's opinion, is responsible for most recurrences. Von Haberer believes that resection of the pyloric glands is essential for removal of the stimulation of the acid-producing components of the residual gastric segment.

While the results obtained with the Billroth I and Billroth II resections are similar the Billroth I resection is regarded as preferable to the Billroth II resection. However the Billroth II operation, in which the end of the stomach is anastomosed to the pars descendens of the duodenum with blind closure of the duodenum is easier to perform than the Billroth I operation.

With regard to extensive resections, von Haberer makes the interesting comment that the ultimate results depend not only upon the technique but also upon the social status of the patient. He states that the postoperative mortality of various surgeons ranges from 2 to 15 per cent. The average postoperative mortality is 5 to 6 per cent and the average incidence of postoperative recurrence of jejunal ulcer 0.6 to 0.7 per cent. Postoperative chronic dyspepsia, malfunction of the pancreas, and the "peculiar secondary gastric anemias" are more frequent after the Billroth II than after the Billroth I resection.

In order to reduce the incidence of unsatisfactory postoperative results the diet should be regulated carefully for at least a year after the operation. Extensive resection should not be attempted when the anatomical conditions make it too difficult, as in ulcers of the posterior wall of the pars descendens duodeni, involvement of the biliary ducts in the inflammatory process, or deep penetration into the pancreas. In the presence of such conditions a smaller palliative operation is advisable. Gastro-enterostomy may be considered, but von Haberer believes that after longer periods of observation the end-results of this procedure will be found less satisfactory as from 25 to 40 per cent of the patients subjected to it will still have symptoms due to an unhealed ulcer and from 5 to 24 per cent will develop a gastrojejunal ulcer. He regards gastro-enterostomy as an operation of necessity rather than of choice.

Pyloric exclusion is mentioned only to be condemned because it does not remove the pyloric glands which incite acid gastric secretion. Von Haberer believes that in cases of non-resectable duodenal ulcer resection for exclusion of the lesion should include the pylorus and the antrum. While such a resection gives better results than gastro-enterostomy, he prefers the latter procedure for non-resectable duodenal ulcers because a

secondary operation for gastrojejunal ulcer is much easier after gastro-enterostomy than after resection for exclusion

He has employed resection for exclusion of a duodenal ulcer 12 times. Three of the patients developed a new peptic ulcer, and 3 have died since the operation, 1 from pneumonia, 1 from hæmorrhagic inflammation of the intestine, and 1 from a subphrenic abscess

For profuse hæmorrhage, von Haberer advocates a blood transfusion followed by resection because palliative surgery does not assure against subsequent bleeding. If resection proves extremely difficult, he merely ligates the blood vessels leading to the lesion. This ligation may be followed later by a more extensive surgical procedure

Perforation is, of course, operated on immediately. Whenever possible a resection is performed. If immediate resection is contra-indicated because of the patient's condition, the perforation is closed and resection is delayed until later. The operation of choice is the Billroth I resection, but when this cannot be performed a Billroth II resection is done. In every case of perforation extensive resection should be the rule and an indirect attack on the ulcer-bearing area should be avoided if possible. However, while the surgical technique and the extent of the resection are important, they are not the sole factors determining the end-results of radical surgery

In the cases of 57 patients operated on by von Haberer and studied later by Bremer and Held (16), 55 gastric resections of the Billroth I and Billroth II types were performed. A satisfactory follow-up study was possible in 48. Of extreme interest was the absence of motor disturbances and of abnormal roentgenological signs as contrasted with the frequency of subjective complaints. The gastric emptying time was radically reduced in all of the cases, but was more rapid after the Billroth II than after the Billroth I operation. Of the 48 patients, 20 did not observe any diet and remained in good health, 14 adhered to a diet and had no subjective complaints, and 14, who were too poor to follow any type of diet, failed to gain weight and complained of symptoms. In the cases of 3 unemployed patients living on an inadequate diet and indulging in tobacco and alcoholic drinks the symptoms ceased after dietetic management. Therefore, of the total number of patients, 77 per cent became symptom-free

*It is thus apparent that even after an adequately radical surgical procedure the results are best when a protracted postoperative medical regime is followed*

Finsterer (33), in a report on over 2,000 cases in which gastric resection was performed, describes his technique in detail and reviews his results. His mortality in 1,658 gastric resections was 5 per cent. Of the gastric lesions, 95.8 per cent were healed and 4.1 per cent were improved. Of the duodenal ulcers, 94.6 per cent were healed, 1.9 per cent improved, and 3.3 per cent unimproved. Of the gastrojejunal ulcers, 75.6 per cent were healed, 7.1 per cent improved, and 16.3 per cent unimproved. Certainly such excellent end-results should be the objective of every surgeon in the treatment of gastroduodenal ulcerative disease. However, it is interesting to note that Finsterer does not condemn resection for exclusion in cases of non-resectable duodenal ulcer, a fact indicating a trend toward greater conservatism at least as regards this type of lesion

Finsterer is of the opinion that in cases of non-resectable duodenal ulcer rapid and complete healing of the lesion will take place after an adequate resection for exclusion provided retrograde filling of the duodenal stump does not occur. He prevents retrograde filling of the duodenal stump by a Hofmeister-Finsterer anastomosis. However, it is important to make the resection so extensive that only the cardiac third of the stomach remains. *A Braun entero-anastomosis is unnecessary as remaining pyloric glands do no harm*

From his experience Finsterer has come to the conclusion that although resection of the antrum has a mortality of 13.8 per cent whereas the mortality of resection with preservation of the pylorus is only 3.1 per cent, resection for exclusion is justified as it is followed by permanent healing in 91.3 per cent of the cases. In his opinion the end-results depend, not upon the resection of the antrum, but upon the extent of the gastric resection. The pylorus should be resected only when the duodenal stump can be properly closed

Enderlen and Zukschwerdt (30) recognize indications and use a technique similar to the indications recognized and the technique employed by von Haberer. They likewise condemn jejunostomy, stating that it is followed in most cases by new ulceration. They state that gastro-enterostomy is indicated only for elderly patients, particularly women. Conservative methods do not give permanent healing. Pyloric exclusion without resection is to be condemned as it has a higher incidence of postoperative recurrence than even gastro-enterostomy which, according to their statistics, is followed by a marginal ulcer in 50 per cent of cases. The surgeon has a choice only between a Billroth I and a Billroth II operation. Enough of the antrum and the fundus should be

removed so that only a third of the normal stomach remains.

As most of Enderlen's and Zukachwerdt's patients in the Heidelberg Clinic had a non-resectable ulcer of the duodenum, it was necessary as a rule to choose between gastro-enterostomy and a resection for excision. An article by Zukachwerdt and Eck (103) reports the results of 107 resections for excision and 71 gastro-enterostomies performed during the last twelve years. The mortality of gastro-enterostomy was 9.8 per cent and the mortality of resection for excision 4.7 per cent. One of the patients treated by gastro-enterostomy subsequently died of perforation and another died of hemorrhage. Only 30 per cent of the patients subjected to gastro-enterostomy were considered cured, whereas 85.5 per cent of those subjected to a resection for excision were restored to health. Of those treated by gastro-enterostomy, 43.3 per cent had post-operative symptoms, whereas of those treated by resection for excision, only 3 per cent had post-operative complaints. These results have definitely convinced the Heidelberg surgeons that resection including the gastric "motor" antrum is the operation of choice.

It is interesting to note that these surgeons find that resection does not control all of the symptoms. The persistence of symptoms is attributed to a residual gastritis. However the latter must not be unduly emphasized since psychic factors play an important part in the causation of symptoms in cases of ulcer a fact suggesting that it might be advisable to refer neurotic patients to a psychiatrist after adequate surgery.

The report of the von Eiseberg Clinic (25) on 1,766 resections performed between 1901 and 1930 should prove of interest to every surgeon. The methods used are in general similar to those of von Haberer and Finsterer but the details of various steps merit consideration. The type of local anesthesia is described. The position of the common duct is carefully determined to avoid its injury. In the description of the operation the authors review in detail the ligation of the important arteries, the preparation of the stomach and duodenum for resection, the closure of the duodenal stump, the selection of the opening in the mesocolon, the picking up of the first jejunal loop, the execution of the anastomosis, the steps required to prevent leakage at the angle between the gastric stump and the jejunum, and the closure of the opening in the mesocolon. All are considered in a very thorough manner making this publication valuable not only to the novice but also to the experienced surgeon.

The concise report of Emerson and Cadner (39) on 1,400 consecutive resections in Verebeley Clinic, Budapest, is important because emphasis is placed upon the use of a sewing clamp after ligation of the blood vessels, incision between 2 rows of metal sutures to prevent escape of the gastric contents, an anastomosis between the stomach and jejunum in which the lower corner of the stomach is resected, and the introduction of the anastomotic sutures below and through the mesocolon. Resection of the lower stomach corner has been done by Verebeley since 1923 and is credited for the reduction in the mortality in all cases of gastric resection from 9.8 to 4.8 per cent.

Of the patients followed up good results were obtained in 1,054 (81.4 per cent), fair results in 308 (26.6 per cent) and poor results in 48 (3 per cent). After palliative operations such as excision with gastro-enterostomy good results were obtained in 49 per cent, fair results in 33 per cent, and poor results in 18 per cent. The conclusion drawn from these results over a nine-year period is that gastric resection or radical surgery performed with the technique described have been found to be more satisfactory both in regard to mortality and permanency than are the results of any of the other methods of treatment.

This Continental preference for resection has to a certain extent been followed by the Scandinavian countries. Pällin (75) says, "In Sweden the development has on the whole followed that of Germany. Thus, during the last decade there has been a decided shift from gastro-enterostomy to resection. At the present time resection would seem to be the operation of choice for most surgeons at the larger hospitals, yet by no means all of them."

In a brief review of the American and German literature, Pällin quotes Walters and Balfour as stating that the peptic ulcers seen in European Clinics differ from those seen in the United States in that they are frequently more extensive, more often multiple, and associated with a greater degree of gastritis, this fact explaining the difference in the attitude of American and European surgeons.

Pällin cites the mortality of von Haberer and Finsterer which is 4.8 per cent, but quotes Guleke as stating that the average mortality must be twice as great. He says that Finsterer's gastric resection for excision has definite merit and has gained recognition by French and German surgeons although it is not much used in England.

During the last ten years Pällin has operated on 109 patients with duodenal ulcer and has re-examined 58 of them from two to eight years after

the operation. Of the latter, 25 were treated by radical resection, 16 by palliative resection for exclusion (retention of the pylorus), and 17 by gastro-enterostomy. The results of palliative resection in which the pylorus was preserved were in no respect inferior to those obtained by the more radical resection, a fact confirming the opinion of Finsterer and refuting that of von Haberer. Of the 25 patients treated by radical resection, 13 were completely symptom-free, 7 were greatly benefited, 2 were slightly benefited, and 3 had poor results. Of the 16 patients subjected to a palliative resection, 10 were rendered completely symptom-free, 5 were greatly benefited, and 1 had a poor result. Of the 17 patients treated by gastro-enterostomy, 10 were rendered completely symptom-free, 5 were greatly benefited, 1 was slightly benefited, and 1 had a poor result. There were 9 postoperative deaths—3 secondary to radical resection, 2 following the palliative resection, and 4 after gastro-enterostomy.

Pallin discusses especially the postoperative precipitate emptying of the stomach to which he attributes many of the unsatisfactory postoperative results following gastro-enterostomy and the Billroth II operation. He emphasizes the impossibility of determining why "rush" emptying occurs in one case and not in another. From his experience in the 109 cases reviewed, he concludes as follows: "It is scarcely necessary to mention that the Billroth I operation, as far as 'rush emptying' is concerned, is superior to other methods. On this ground, the Billroth I operation proves one of the advantages of radical resection over palliative resection. But in comparison with gastro-enterostomy, which is best reserved for more elderly people with pyloric stenosis, I am entirely in agreement with Finsterer's opinion regarding the decided preference for the palliative resection."

Germanic teachings have in general dominated the French surgeons in the surgery of gastroduodenal ulceration. Leriche (66) is guided by Finsterer's teachings in his surgical therapy. His objective in the treatment of gastroduodenal ulcerative disease is the removal of enough of the acid-secreting portion of the stomach to produce achlorhydria. In 225 cases operated upon by him in the period from 1925 to 1932, he performed 129 gastro-enterostomies and 96 resections. Of the 96 resections, 14 were performed for duodenal ulcer. Leriche reserves gastro-enterostomy for small duodenal lesions which lead to pyloric stenosis. He states that resection is the operation of choice for lesions which have perforated into adjacent organs, ulcers of the lesser curvature, ulcers high

in the stomach, and calloused large gastric or duodenal ulcers. The only argument against extensive resection is its surgical mortality. The end-results of extensive resection are far superior to those obtained with gastro-enterostomy. In the 96 reviewed cases in which resection was done there were 14 deaths, and in 13 of the 14 fatal cases, autopsy showed the cause of death to have been failure of the surgical technique. Pylor-ectomy and antrumectomy do not achieve the goal of reduced acidity. The latter requires an extensive gastric resection. In Leriche's cases the Billroth I operation is never done, either a Polya or a Hofmeister-Finsterer gastrojejunal anastomosis is performed.

In spite of all these data favoring resection, Leriche says, "Gastro-enterostomy is a very good operation as evidenced by the fact that, of the 225 patients operated upon for ulcer, a gastro-enterostomy was performed on 129."

The results obtained in the surgical treatment of gastroduodenal ulcer and the conclusions based on the cases of such ulcers occurring in the Balkans are found in the report of Fuerst (40). Gastro-enterostomy is condemned as it fails to effect a cure in from 40 to 50 per cent of cases whereas resection is followed by healing in 90 per cent. The ultimate results following the Billroth I method are better than those following the Billroth II method. Resection for exclusion, as performed by Finsterer, has apparently seldom been used, the operation of choice being, whenever possible, a Billroth I resection.

Of interest to surgeons who stress the acid factor in gastro-intestinal ulcerative disease will be the report of Kemal (59), who, in 314 surgically treated patients, found hypo-acidity instead of hyper-acidity. Kemal is of the opinion that, at least in Turkey, acidity is of minor importance. He never observed malignant changes, perforation, or fatal hæmorrhage after a gastro-enterostomy. Marginal or postoperative peptic ulcer occurred in only 2 cases, in both of which there was hypo-acidity. Of Kemal's cases treated by gastro-enterostomy, the operation was followed by death in 6 per cent, permanent healing in 82 per cent, and improvement in 13 per cent. Of the cases in which resection was done for a large calloused ulcer and malignancy was suspected, the operation was followed by death in 11.3 per cent and permanent healing in 95 per cent.

In comparison with these Continental results, Gaither (42) reports on 100 cases collected by means of a questionnaire sent to 500 patients and evaluated by an internist who interrogated the patients personally in addition to studying them

physically and roentgenographically. Of the cases in which gastro-enterostomy was performed, complete relief resulted in 80 per cent, whereas of the total number of cases representing the results of all types of operations, complete relief was obtained in 73 per cent, marked improvement in 10 per cent, and no improvement in 9 per cent. Galthier concludes that gastrojejunal ulceration, catastrophic hemorrhage, and perforation are rare after gastro-enterostomy. The immediate mortality and the end-results of gastro-enterostomy and other conservative types of operation do not justify the displacement of conservative surgery by subtotal gastrectomy. Although the time interval between surgical intervention and examination of the patient is not mentioned, it is noteworthy that 70 per cent of the patients had been carefully following postoperative dietetic routines.

Labey (44) discusses the selection of the operative procedure for various gastric and duodenal lesions and comes to the conclusion that in the order of the best results, partial gastrectomy undoubtedly stands at the head of the 3 general operative procedures, followed by pyloroplasty and gastro-enterostomy. On the other hand, it must be admitted also that partial gastrectomy performed by almost any surgeon will have the highest mortality rate of any of the gastric procedures for duodenal ulcers; that pyloroplasty will have the lowest mortality rate and that gastro-enterostomy will have the intermediate mortality rate, but in the long run will probably give the poorest end-results. Labey therefore believes that the selection of operation for duodenal ulcers, particularly ulcers which are partly or entirely retroperitoneal, should be reserved until the abdomen is opened and the lesion visualized.

Labey states that he is not as enthusiastic about gastro-enterostomy as he was some years ago. "Nevertheless situations not infrequently arise where a satisfactory operative procedure on a given case possesses prohibitive possibilities of mortality, and it becomes very much better to accept a less satisfactory operative procedure for the associated lessened operative mortality. He believes that the incidence of gastrojejunal ulcer can be very materially diminished if patients with a gastro-enterostomy be taught to adhere post-operatively to a rigid dietary regimen.

Among the numerous reports on perforated peptic ulcer Graves' analysis of 4,405 cases occurring in the German Clinics (43) is outstanding. Graves stresses the danger of drawing erroneous conclusions from a study limited to mortality statistics alone. He states that simple closure of a

perforated ulcer is the easiest and quickest operation and affords the best immediate prognosis, but in most German clinics it has usually been performed on patients in extremely poor condition and more radical surgery is reserved for those who have been fair to good risks. Therefore the mortality rate attending the simple operation may be very high, as in the series reported from Graves' Clinic, Frankfurt-am-Main, in which it was 58 per cent, and in the entire collected German series, in which it was 50 per cent.

In the collected German series of cases of perforated ulcer resection was done 775 times with a mortality of 18.2 per cent. Graves concludes that the low mortality is explained by the selection of patients in better condition and the greater ease and skill with which gastric resection is done by German and Austrian surgeons who have had great experience with that operation.

Routine partial gastric resection for perforated peptic ulcer in Central European patients who are good surgical risks is justified because:

1. Peptic ulcers are multiple in about 30 per cent of all patients who have a perforation.

2. Atrophic, hypertrophic or ulcerative gastritis is usually present in the ulcer-bearing area of the stomach.

3. The lesions present, particularly those in the duodenum cannot be judged by inspection and palpation alone.

4. Gastric resection is performed by most German and Austrian trained surgeons in from forty to seventy five minutes.

5. The mortality rate in the cases of patients who are selected good risks is not over 5 per cent.

6. Gastric resection is usually technically easier in cases of perforated ulcer than in elective cases of peptic ulcer.

7. The simpler procedures do not always cure the ulcer or alleviate the gastritis and are frequently followed by recurrences of peptic ulcer or the development of a marginal ulcer.

Shaw (91) reports on 227 cases of acute perforated duodenal and gastric ulcer in which the mortality was 24.2 per cent, in contrast to the mortality of 8.2 per cent in 613 or 775 cases in which resection was done. In 188 (75 per cent) of Shaw's series of cases, simple closure of the perforation was done. The mortality was lowest in 36 cases treated by excision of the ulcerated area and closure. Closure plus gastro-enterostomy was done in 22 cases with a slightly higher mortality.

Comparison of these 2 groups is interesting in that the more conservative measures failed to decrease the immediate mortality whereas it may be assumed

*that the more radical surgical technique will be followed by better end-results.*

Rousselin (86) has made some interesting observations on gastroduodenal perforation. He has noted that the mortality is lowest in perforation of the duodenum and is greater the higher the site of the perforation in the gastro-intestinal tract. Of his series of cases, the mortality was 15.5 per cent in those of duodenal perforation, 51.5 per cent in those of perforation in the pylorus, and 71.4 per cent in those of perforation in the lesser curvature. This variation in mortality may be secondary to the fact that the size of the perforation increases from the duodenum upward. After discussing the usual factors of perforation, such as the time elapsing between the perforation and surgical intervention and the age and general condition of the patient, Rousselin states that he obtained a cure in 70 per cent of his cases, but that the best end-results were obtained in those in which there were no ulcer symptoms prior to the perforation.

In contrast to the conclusions of Graves, Rousselin, and Shawan, are those drawn by Black of England (10) on the basis of 50 cases of perforated gastric and duodenal ulcer operated on in the period from 1927 to 1931. Black concludes that (1) the simpler the operation the better, (2) the methods and skill of the surgeon are not of great importance, and (3) the time elapsing between the perforation and operation is of chief importance. The last conclusion will be vigorously contested by many experienced Continental surgeons who believe it is not the time factor but the condition of the patient which should guide the surgeon.

Scotson (89) reported on 181 cases of perforated peptic ulcer in which the mortality was 17 per cent. He has confirmed Rousselin's observation that the mortality is greater the higher the site of the perforation in the gastro-intestinal tract. He believes it is explained by "the likelihood of serious hæmorrhage preceding perforation as well as the larger size of the perforation and greater amount of infectivity of the extravasated contents, and also the difficulty, in many cases, of making a satisfactory closure of the perforation in a large gastric ulcer." Of significance is the fact that none of his patients with duodenal ulcer who were treated by suture and gastro-enterostomy had any severe postoperative symptoms and in the patients who followed instructions regarding diet, hygiene, and the use of alkaline powders the end-results were as a general rule very satisfactory regardless of the type of surgery.

Much of value to both the internist and the surgeon may be obtained from an article on hæmorrhage by Allen and Benedict (1). During the last twenty years 1,804 patients with duodenal ulcer were treated in the Massachusetts General Hospital. Of these, 628 either gave a history of gross bleeding or, while under observation, lost blood in amounts recognizable by macroscopic study. Of these, 176 were classified as moderate bleeders, the blood loss not being sufficient to reduce the red blood cell count to 3,000,000 or the hæmoglobin to below 70 per cent. Two hundred bled sufficiently to produce a marked secondary anaemia. Of these, 62 bled gradually over a period of weeks and 138 had a hæmorrhage coming on with sufficient suddenness to produce prostration, shock, and marked anaemia. *Therefore 22 per cent of the patients with duodenal ulcer complicated by hæmorrhage could be classified in the acute massive hæmorrhage class.* Twelve of these patients bled to death before operation could be performed, and 8 were operated on in a depleted state without success. *The mortality in this group was therefore 14.5 per cent.* In nearly every fatal case it was possible, either at autopsy or at operation, to demonstrate the erosion of a large artery. *The striking difference between cases of apparently the same severity on admission in which bleeding ceased spontaneously and those in which the bleeding continued to a fatal termination was the average age. In the fatal group the average age was fifty-six and three-tenths years while in those with recovery it was forty-one and eight-tenths years.* It has been more or less commonly believed that patients are more likely to recover after one attack of severe bleeding than after several attacks, but as in 65 per cent of the fatal cases reviewed death occurred during the first period of bleeding, it is evident that the number of hæmorrhages is not a reliable criterion of the prognosis.

Of the 20 patients who died, 12 had not bled previously, 7 had bled only once before, and 1 died during the fifth attack of bleeding. There was little evidence that transfusion had had any relation to continued or marked bleeding. Five patients died of hæmorrhage without transfusion. Of the patients who bled out several transfusions in a period of from one to five days, all died whether operated upon or not.

Blood was given the patient only on his failure to hold his own with a systolic blood pressure above 70 mm Hg. To eliminate the danger of rapidly elevating the blood pressure, the blood should be given slowly in amounts of about 300 c cm. In many cases in which this treatment has been given there has been no further serious

## INTERNATIONAL ABSTRACT OF SURGERY

bleeding. After the patient is safely over the acute state of hemorrhage (from five to seven days) blood transfusion will materially shorten his hospital convalescence.

Operation should be considered and undertaken in a large percentage of cases in which the patient rapidly loses the benefits of transfusion. When a patient enters a hospital in a depleted state or through mistaken judgment is allowed to reach a precarious condition, either his condition may be looked upon as hopeless or a heroic attempt may be made to save his life. In the 30 fatal cases reviewed by Allen and Benedict watchful waiting and late surgery were both tried. Allen and Benedict describe a surgical technique of resection plus control of bleeding and emphasize the necessity for being prepared to cope with hemorrhage in a logical manner.

In the period from 1911 to 1933, 80 cases of severe hemorrhage from peptic ulcer were admitted to the Fourth Medical and Surgical Division of the Bellevue Hospital by Hiltner (33). In this group there were 9 cases of peptic ulcer treated conservatively with a fatal outcome. The mortality in this group is strikingly similar to the mortality reported by Benedict and Allen and, like the latter, demonstrates the importance of definite preparation to cope with hemorrhage in a logical fashion while previously determined operative indications are being followed.

Bobman (1) reports 124 cases of severely bleeding ulcers, in one-half of which operation was performed. The total mortality was 3.4 per cent and the mortality of radical operation, 10.4 per cent. If the patients operated on in extremis are eliminated, the postoperative mortality is brought down to 9 per cent. Bobmanson believes that, especially in old patients with large arterial erosions, blood transfusion may provoke a fatal hemorrhage. In his cases hemorrhage was not considered a contra indication to surgery. With regard to the age of the patient he emphasizes that hemorrhage is much more serious in the old than in the young.

Panchet (78), discussing the treatment of massive gastroduodenal hemorrhage, stresses the necessity of an accurate diagnosis because two-thirds of the cases have no specific diagnosis and no demonstrable organic lesions, thus constituting the zone of the indeterminate in which specific surgery is not indicated. Ligation of single blood vessel, gastro-enterostomy and jejunostomy alone are inadequate. The toxic effects of putrefying blood in the bowel must be eliminated by continuous drip irrigation.

Papin and Wilmoth (75, 77) discuss hemorrhage at great length and emphasize the necessity of determining, if possible, which patients will stop bleeding. They conclude that there are no clinical determinations which will answer this question. They agree with Hartmann who believes that surgical intervention is indicated only in the cases of patients with a long ulcer history. In 11 of their cases in which an exploratory laparotomy was done there were 9 deaths. They believe that gastro-enterostomy is of value only in cases of chronic calloused stenosing pyloric ulcer and that pyloric excision is of no value. In their cases in which an extensive resection of the stomach and duodenum was done the mortality was 19 per cent.

Tuxler and Clavel (97) in a review of 73 cases, conclude that Finster's practice of radical resection gives the best end-results. They state that when once the ulcer is exposed and hemostasis is obtained, the surgeon's natural inclination is to limit the surgery but such a routine practice gives unsatisfactory results. The best results are obtained by resection followed by resection of blood transfusions. They emphasize the necessity of investigating other etiological factors of hemorrhage such as circulatory stasis and in contradistinction to cases of hemorrhage of arterial origin, cases of hemorrhage due to circulatory stasis and gastritis with erosion of small blood vessels are best treated by medical measures.

The clinician must remember that about 35 per cent of all patients with gastroduodenal ulcerative disease bleed at some time during the life cycle of their lesions; that 21 per cent of those who bleed have acute massive hemorrhages; that of those with massive hemorrhages, 15 per cent will be so exsanguinated upon hospitalization that they will die whether the treatment is medical or surgical, that surgical intervention is most proper time will decrease this mortality below the mortality in a similar group of depleted patients treated medically; that there are no true criteria for deciding which patients will stop bleeding solely under medical therapy and that the end results will be best if the patients who fail to hold their own after transfusion are operated upon early by a definitely planned surgical routine directed at this emergency.

Although the surgical technique of the various procedures used in the treatment of gastroduodenal ulceration is standardized except for insignificant modifications, the 1933 literature contains innovations which suggest progress. In

the description of a method of dealing with the proximal jejunal loop in the posterior Pólya anastomosis after partial gastrectomy (63), Lahey cited among the difficulties encountered in this operation (1) angulation of the intestinal loops, (2) difficulties in suturing the anastomotic stoma wall below the transverse mesocolon, (3) tension on the anastomosis when a short proximal jejunal loop is used, and (4) the danger of an obstruction if the gastrojejunal anastomosis recedes above the opening in the mesocolon with the formation of a double-barrelled loop of proximal and distal jejunum penetrating through the transverse mesocolon. Many of these complications may of course be avoided by an anterior Pólya anastomosis, but this procedure also has disadvantages. When, in the latter, the jejunal mesentery is so short that, on being brought up to a reasonable level over the transverse colon to reach the cut end of the stomach, it produces pressure upon the transverse colon, any colonic distention is associated with danger of obstruction. Moreover, in order to obtain a jejunal loop which will reach over the transverse colon, a long loop must be used and the gastric contents are emptied into a relatively low segment of jejunum, which is not desirable.

By simply incising the ligament of Treitz from its lowest insertion in the jejunum to its origin in the mesenteric root, it is possible to mobilize the proximal jejunum so that it may be anastomosed to the stomach through a slit made in the transverse mesocolon. Thus the entire proximal loop of jejunum is brought above the mesocolon and excluded from the greater general peritoneal cavity. When this procedure is followed, only one loop of bowel ultimately traverses the transverse mesocolon. It is not necessary to suture the stomach above the gastrojejunal anastomosis to the transverse mesocolon, and tension and angulation of either of the jejunal loops is readily avoided.

The solution of many of the problems of gastric resection by such a simple procedure as incision of the ligament of Treitz is at first difficult to visualize, but after the first trial the ease and practicality of this method become obvious.

Back of England (6) has suggested a new technique for gastrojejunostomy. Several years ago he decided that easier access to the posterior wall of the stomach would be provided by exposure through an incision in the great omentum. He first makes an incision in the gastrocolic omentum parallel with the greater curvature which gives free access to the lesser sac and through which the whole posterior wall of the stomach can be thor-

oughly examined. The transverse colon is then held up by the assistant and the second opening is made into the lesser sac through the transverse mesocolon. A coil from the upper part of the jejunum is brought up through the opening in the transverse mesocolon and the most proximal part that can be apposed to the stomach without strain or tension is clamped. The transverse colon is then returned to the abdominal cavity and the anastomosis made in the usual way except that it is done in the lesser peritoneal cavity. Finally, the edges of the opening in the transverse mesocolon are fixed to the jejunum by a few interrupted sutures and the opening in the gastrocolic omentum is sewed up.

Back believes that this method has many advantages over the usual technique, in that the entire posterior wall of the stomach can be examined, traction on the stomach is avoided, and the transverse colon is returned to the abdominal cavity to prevent chiling. Since his adoption of the method both his immediate and his late results have been better.

Konjetzny (62) reports further studies on antroduodenitis. These are important because many Continental surgeons contend that radical resection is the only procedure capable of removing all of the lesions present in the ulcerated stomach. It is an unsettled question whether digestion or erosion occurs in a healthy gastric mucosa or only after an inflammatory process. Many patients who have no true ulcer give the classical ulcer history because of antroduodenitis. When such patients are subjected to operative exploration, the surgeon must decide what surgical therapy, if any, is indicated. Konjetzny believes that when the symptoms persist gastric resection is eventually indicated. This is true particularly when the gastric mucosa shows a polypoid hyperplasia and when chronic gastritis has progressed to the point of organic pyloric stenosis. Resection is indicated also when the differentiation between a benign pyloric hypertrophy resulting from gastritis and a fibrous carcinoma is difficult.

The studies by Aschner and Grossman (4) of 124 specimens of antrum and duodenum obtained by gastrectomy in New York suggest that at least in the Eastern United States the pathological changes of gastroduodenal ulcerative disease simulate closely those associated with gastroduodenal disease in Continental Europe. Ulcers were never found in normal gastric or duodenal mucosa, their development being always preceded by a gastritis or a duodenitis. Despite spontaneous healing of an ulcer, the underlying gastritis and duodenitis may persist and predispose to new ulcera-



## INTERNATIONAL ABSTRACT OF SURGERY

tion. Aschner and Grossman observed also cases of gastritis and duodenitis with erosions in which X-ray examination was negative and exploration revealed no little pathological change that the surgeon found no indication for operation. Patients with such conditions have classical symptoms of ulcer and as a rule develop a typical ulcer later.

Antroduodenitis of this type may be responsible for failure after gastro-enterostomy. Pulli (81) reports 24 cases in which resection was performed subsequently. In all of them there was marked hyperplastic mucous inflammation which was most severe in the antrum but was present also in the duodenum.

Hoenig (53) discusses chronic inflammatory changes in the gastric mucosa in a similar fashion. He limits surgery to cases of stenosis, suspected carcinoma, postoperative hemorrhage, and failure of medical treatment.

Zakischewski and Zettel (104) do not question the existence of gastritis in a large number of patients for whom gastric resection was indicated, but insist that there are many persons with gastritis who have no subjective symptoms. The diagnosis of gastritis is made roentgenologically and gastroscopically. Zakischewski and Zettel were interested in the histological findings in the stomach left after resection because in every one of the 66 cases reviewed by them they found a definite gastritis at the edge of the resected specimen.

Roentgen examination disclosed hypertrophy of the gastric mucosa with accentuation of the mucosal folds, the atrophic, flattened mucosa, and the polypoid hyperplastic mucosa. Twenty-seven of the 44 patients examined postoperatively showed a gastritis on roentgen examination, but 18 of the 7 were symptom-free. Emphasis is laid upon the pericolic angle of postoperative complaints and the importance of referring the patient to a psychiatrist, but the fact that 18 of the 37 symptom-free patients still showed residual pathological changes raises the question whether it would not be wise to refer the patients to a psychiatrist in the first place and postpone or omit operation.

#### RESULTS OF MEDICAL THERAPY OF GASTRO-DUODENAL ULCERATIVE DISEASE IN 1933

On the medical side an almost equally large number of methods of therapy are proposed. Kohn (61) dwells on the similarity between peptic ulcer and the early lesions of thrombo-angiitis obliterans. He says, "Despite the variation in histological details, the final picture in peptic ulcer and thrombo-angiitis obliterans stimulate one

another rather closely." As peptic ulcer represents a disturbance in the blood supply in the immediate neighborhood of the ulcer and the pains of peptic ulcer and the pains occurring in thrombo-angiitis obliterans are strikingly similar, it appears that the treatment of peptic ulcer should be based on the same principles as the treatment of end arteries and veins.

In the treatment recommended by Kohn a solution of chemically pure sodium chloride, sodium chloride and a buffer agent dissolved in distilled water is brought to a hydrogen-ion concentration which is slightly alkaline and injected intravenously. The initial dose is usually from 15 to 30 c.c.m. Later the dose may be increased to 100 c.c.m. The solution is injected daily every other day or twice a week. By this treatment 18 of 50 patients were apparently cured, 12 were benefited markedly, 8 were benefited to an appreciable degree and 3 were benefited only slightly.

Immunization therapy is again advocated by Hafford (56) who used a green-producing, Gram positive diploptococcus obtained from resected stomachs. Of 16 patients treated with a stock ulcer vaccine in addition to diet and oral medication, all evident foci of infection disappeared in 71 and the ulcer recurred in only 3 (8 per cent). Of the 45 patients in whom the ulcer were not completely eradicated, the ulcers recurred within from one to three years in 8 (17.8 per cent). Of 34 patients treated dietetically without inoculation, all evident foci of infection were removed in 8 and, to date the ulcers have recurred in only 8 (44.4 per cent) of these 8. Of the remaining 6 recurrences have developed in 3 (81 per cent). This confirms the teaching of many investigators that foci of infection undoubtedly play an important part in the formation of ulcers. Perhaps surgeons might improve their end-results by rapidly eliminating every possible focus of infection in addition to performing the local operation on the gastro-intestinal tract.

During the last four years Trappe (58) gave 8 patients with ulcer a 1:500 solution of metaphen in a dose of 4 c.c.m. 3 times a day. No other medication and no restriction of the diet was prescribed. The pain was relieved within an average of three days without any demonstrable toxic effect from the metaphen. Besides the control of subjective symptoms, there was roentgen evidence of objective improvement with complete disappearance of the gastric and duodenal lesions. Trappe attributes the results to control of infection in the gastro-intestinal tract by the metaphen. He makes no mention of kidney irritation by the metaphen, which is a mercurial product.

In the Alvarez Lecture given before the American Gastro-Enterological Society, Hurst (57) emphasized the unity of gastric disorders. A study of the anatomy and physiology of stomachs of healthy young adults of both sexes showed that under perfectly normal conditions there is a considerable variation from the average. In 80 per cent of persons the variations occur within comparatively narrow limits and the anatomy and physiology of the stomach are so perfectly adjusted to the exigencies of ordinary life that these persons are likely to reach old age without ever suffering from any form of chronic gastric disorder. Of the remaining 20 per cent of persons, one-half are born with a hypersthenic gastric constitution and the other half with a hyposthenic gastric constitution. The hypersthenic group have a hyperchlorhydria often associated with a short, high, rapidly emptying stomach, and the hyposthenic group, a hypochlorhydria and a long, slowly emptying stomach. Both constitutions are compatible with perfect health, but under unfavorable circumstances persons with a hypersthenic constitution are predisposed to gastric or duodenal ulceration and those with a hyposthenic constitution are predisposed to carcinoma of the stomach and Addison's anemia.

In hypersthenic persons with a constitutional hyperchlorhydria and rapid gastric emptying the stomach is empty for a much longer portion of the day or night than in the average individual. Accordingly, there is much more opportunity for damage to the mucosa by such irritants as alcohol, tobacco, and drugs. In addition, fractional Ewald meals in individuals of this type show not only hyperchlorhydria but also a decrease in mucus secretion. Because of the reduction of the capacity of the stomach to secrete mucus, which is a characteristic of the hypersthenic constitution, the protection against damage which is afforded by the layer of mucus in the hyposthenic stomach is absent. According to Hurst's theory, it seems reasonable to conclude that persons with deficient mucus secretion should be fed mucin in order to protect the gastroduodenal mucosa and restore as closely to normal as possible the relationship of the mucin content to the other components of gastric secretion.

#### MUCIN THERAPY

The mucin therapy for gastroduodenal ulcerative disease devised by Fogelson has been the subject of as much controversy as most other treatments for that condition, but is reported meritorious even by many of its critics. Block and Rosenberg (11) say: "It is noteworthy, neverthe-

less, that partial or complete symptomatic relief was achieved with mucin in 7 patients who failed to respond to other forms of therapy. Such results indicate that gastric mucin may have a place in the treatment of peptic ulcer, notwithstanding the shortcomings previously discussed as untoward symptoms, although prolonged observation under carefully controlled conditions is essential to the formulation of any definite conclusion. At the present writing, then, we should advocate its use in cases refractory to other forms of treatment and as a step toward the evasion of a surgical procedure."

Rivers and Vanzant (85), who have used mucin in more than 150 cases of peptic ulcer, report that about 50 per cent of their patients responded favorably when mucin was employed. They caution against the use of mucin in cases of peptic ulcer associated with disease of the urinary or biliary tracts because of the increase in the blood urea in such cases.

Many physiological reports have been published in 1933 which support Hurst's hypothesis and strengthen the position of gastric mucin in the treatment of gastroduodenal ulcerative disease.

From investigations of the action of mucus in the automatic regulation of the acidity of the gastric contents, Bolton and Goodhart conclude that the only means possessed by the normal stomach to reduce the acidity of its contents is the secretion of mucus.

Florey (38), in reporting his observations on the functions of mucus and the early stages of bacterial invasion of the intestinal mucosa, states that by microscopic inspection of living intestinal mucosa it was possible to see that mucous secretion has as one of its functions the cleansing of the villi from small adherent particles. This is accomplished by the movements of the villi and other intestinal motor activities which bring the particles into contact with sticky mucus secreted by the goblet cells and present as a lace like meshwork over the mucosal surface. The mucus with adherent particles is then rolled up into small masses by the intestinal movements and propelled onward by the peristaltic action of the bowel.

Florey and Harding (39) found that by isolating duodenal loops between the points of entrance of the biliary and pancreatic ducts, the secretion of Brunner's glands could be obtained. This secretion is a clear, slightly opalescent "mucous" juice of the consistency of egg white. It is apparently homogenous and can be diluted with water. Its most remarkable feature is its large carbonate

content. Hydrogen-ion estimations made colorimetrically showed a pH of from 8.0 to 8.2. Brunner's glands can be activated by pouring hydrochloric acid over them. Flory and Harding conclude, "The significance of the alkaline secretion for the protection of gastric and duodenal mucosa is indicated and a possible relationship between a failure of secretion and the production of peptic ulcer is suggested."

In France, numerous articles by Monceaux (22) have led to extreme enthusiasm for the use of mucin not only in the treatment of lesions in the upper part of the abdomen but also in that of lesions elsewhere in the gastro-intestinal tract. The French have become convinced by their experimental and clinical investigations that mucin is an important therapeutic agent for gastro-intestinal lesions.

During 1933 about 12 tons of gastric mucin were used in the United States alone by over 500 clinicians who reported their results to the Gastric Mucin Committee of the Northwestern University Medical School. The only cases considered in the evaluation of gastric mucin for gastroduodenal ulcerative disease were cases of so-called

"Intractable" ulcer which had failed to respond to the ordinary medical regimes and for which surgical therapy was being considered. Thirty-three per cent of the patients had had previous surgical treatment and had developed a recurrence. The 500 clinicians with limited experience in mucin therapy found it possible to render 63.1 per cent of these patients with intractable ulcer symptom-free. Of the remaining patients, 39.4 per cent were benefited by the treatment and 7.5 per cent were not benefited.

The viscosity and emulsion properties of mucin which are supposed to protect the ulcer from mechanical and chemical irritations suggested to Jones, Ivy, and Attkisson (58) the use of the vegetable mucilage from okra in the treatment of ulcer. These investigators report that in 3 cases in which they employed a highly purified vegetable mucilage prepared by them and called "okrin" very satisfactory results were obtained. Meyer Seidman, and Necheles (70) in reporting a repetition of their work in the cases of 17 patients with definite duodenal or gastric ulcer say: "Fourteen of these had immediate relief of symptoms on taking powdered okrin in 1-gm. doses every two hours."

In addition, many other types of medical therapy have been suggested. Ford and Storm (80) report encouraging results from injections of sodium benzoate. Niles (73) like Pitkin, has obtained gratifying results from the intravenous administration of foreign protein, animal fats, and

emeth. Many French investigators and clinicians are reporting encouraging results from treatment based on theories regarding the rôle of certain amino acids in the pathogenesis and treatment of ulcer. Weiss and Aron (100) for example state that following modified Esaki or as it is known in America, the Mann-Williamson operation to produce experimental ulcers, there is incomplete digestion of proteins with the end-result that the amino acids necessary as building stones for body proteins are not available. When histidine and tryptophan are injected the incidence of experimental ulcer is radically reduced. On the basis of these experimental findings, Ford and Storm treated cases of ulcer with injections of 3 per cent tryptophan and 4 per cent histidine. This treatment was followed by cessation of the pain, hyperacidity and hemorrhage, a marked gain in weight, and restoration of the roentgen picture to normal.

The neurogenic etiology of peptic ulcer presented so ably by Cushing (24) in 1935 is again advanced by Connor (31) who noted an association of pituitary tumors and peptic ulcer. Connor suggests the use of pituitrin subcutaneous (especially in the treatment of early cases of peptic ulcer).

Babkin (5) and his coworkers, in an article on the nervous control of gastric secretion and the effect of vitamin deficiency on its production, report that they have determined a gastric secretory response to stimulation of the parasympathetic and sympathetic nervous systems. They have increased our knowledge of the physiological functions of the gastric mucosa by demonstrating that a deficiency of vitamins radically reduces the response to stimulation of these nervous systems. When vitamins are again added to the diet the original response to nervous stimulation is practically restored. This may explain the formation of experimental ulcers on diets deficient in vitamins.

#### Abstract

The literature on gastroduodenal ulcerative disease during the last year has been concerned largely with an evaluation of end-results from the various surgical procedures. Judging from the reports published, the operation giving the best end-results is the Billroth I resection. In cases of duodenal lesions in which this operation is difficult or precarious, and those in which it is impossible to obtain healthy duodenal mucosa for gastroduodenal anastomosis the surgeon has the choice between a Billroth II operation or one of its various modifications such as the Hofmeister Finsterer resection. A wealth of material has

accumulated substantiating Finsterer's contention that a resection for exclusion is justified in cases of duodenal ulcer in which resection of the ulcer is difficult and dangerous. Lahey's modification of the Polya operation should eliminate many of the undesirable postoperative mechanical complications. Lahey's lack of enthusiasm for gastroenterostomy and other palliative surgical procedures may be considered indicative of a further American trend toward more extensive surgical therapy in gastroduodenal ulcerative disease.

It is noteworthy, however, that many surgeons are beginning to realize that frequently surgical therapy will not by itself yield a complete cure, *since after the most extensive surgical treatment individuals with the ulcer diathesis still require medical management to achieve the best end-results*.

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# ABSTRACTS OF CURRENT LITERATURE

## SURGERY OF THE HEAD AND NECK

### HEAD

III the A. Benign and Malignant Parotid Tumors and Their Amovability to Cure (Gehirne und bösartige Parotidgeschwülste und ihre Heilungsmöglichkeiten) *St Tag. d. deutsch. Ges. f. Chir.* Berlin, 1934.

During the purely operative era the outlook for the cure of parotid tumors was very favorable in cases of benign tumor but very unfavorable in cases of malignant tumor. About half of the patients with malignant tumors came for treatment in a condition in which operation was no longer possible technically. In most of the cases which were still operable a very extensive intervention destroying the facial nerve, including usually resection of the external carotid artery and including sometimes resection of the vertical ramus of the lower jaw and the external auditory meatus was necessary. While the primary mortality of the extirpation was low, rapid recurrence usually spoiled the operative result which at first seemed favorable as regards life and health.

At the Surgical Clinic of the University of Berlin, irradiation has been used in a constantly increasing number of cases during the last twenty years. Histologic dissection the results, the conclusions derived therefrom, and the future establishment of the indications for treatment. The benign tumors are included in the discussion because they also have a marked tendency to recur and not rarely are the forerunners of malignant tumors. In the period from

1901 to 1933 86 patients with malignant parotid tumors, 7 with benign parotid tumors, and with benign mixed tumors of the submaxillary gland were observed at the Surgical Clinic and the Koenigstein Radium Institute. The average age of the patients with malignant tumors was about forty-five years, but the difference in their ages was very great, the ages of the males ranging from twelve to seventy-six years and those of the females from six to sixty-eight years. The ratio of males to females in malignant parotid tumors was about 1. Carcinomata were more frequent in the males and sarcomata more frequent in the females. The ratio of males to females with benign tumors was about 3.

In the classification of the cases the malignant mixed tumors must be placed in a group separate from the carcinomata and sarcomata for practical clinical reasons as they are usually preceded by benign mixed tumors. In addition to the malignant mixed tumors, there is a small special group of a peculiar nature, the malignant cylindromata which are usually preceded by benign cylindromata. The

important fact that, sooner or later even after as long as twenty years, benign parotid tumors can change into malignant tumors, necessitates cure and precaution also in cases of benign tumors. The first signs of such a change are sudden increase in size, softening, loss of distinctness of the border and loss of mobility of the tumor pain, and facial paralysis. These signs must be observed at their very beginning. When locking of the jaw metastases in the neighboring lymph nodes, extensive deep proliferation, and ulceration have occurred cure can no longer be expected from any procedure. In almost one-third of the cases of malignant parotid tumor revivals of the neoplasm had been present for a long time, fact indicating that it had previously been benign. With every second or third case of benign mixed tumor we must reckon with the danger of the development, sooner or later of a malignant change or malignant recurrence and it is our duty to take this into consideration in determining the indications for treatment. In the literature up to the present time there are few reports based upon a considerable number of cases from a single source which were followed up for large numbers of years. Reports of the results obtained five years after treatment in cases of malignant parotid are few.

I. 92 Krasner reported on 27 cases of carcinoma of the parotid gland among which there was a case of eight-year survival and a case of five-year survival after the operation. However in both of the latter an inoperable recurrence developed. Of 30 patients treated for parotid carcinomata whose cases are reported by Benedict and Mengs in 1931 survived ten years. This patient was treated by roentgen and radium irradiation in addition to operation and was free from symptoms after seven years, but finally developed recurrence. Among 9 patients treated for sarcoma of the parotid gland whose cases are reported by Benedict and Mengs there were who remained free from symptoms for five years. I. 1935, Duzet, Creyssel, and Héard reported that in a case of malignant mixed tumor among 9 operable cases of carcinoma of the parotid gland they obtained survival of six years by means of radium therapy alone and three- to six-year survival in 3 of 7 cases treated by extirpation and radium irradiation. In 1933 Schlim reported that of 10 patients operated upon at the J. na Surgical Clinic for carcinoma of the parotid gland, 1 remained free from recurrence after seven years.

In the entire literature there are reports of only 6 cases of malignant tumor of the parotid gland in which the patient remained free from symptoms for

five years or longer. Therefore the results in the cases treated by Hintze may be regarded as very good. Among 50 microscopically confirmed cases of primary malignant tumor of the parotid gland the five-year limit was extended by exclusively operative treatment in 2 cases of carcinoma, 2 cases of sarcoma, 2 cases of tumor representing a transition from carcinoma to sarcoma, and 1 case of malignant mixed tumor. In 1 case of carcinoma and 1 case of transitional tumor, prophylactic irradiation was given after operation. In 2 cases of carcinoma, 1 case of sarcoma, and 1 case of malignant cylindroma irradiation was given for recurrence after operation. Altogether, 13 (about 42 per cent) of 31 patients were still alive after five or more years. Of these, 8 (about 26 per cent) remained free from symptoms. Of 6 patients with an inoperable condition who were treated primarily or exclusively by irradiation, 2 were living after five years and 1 of these was free from symptoms. The total results of this eclectic therapeutic measure in cases of microscopically proved malignant parotid tumor show that 40 per cent of the patients survived for five years and 25 per cent remained free from symptoms for five years. If 1 unexplained death occurring two months after operation is excluded, the findings in cases of benign tumor (benign cylindroma and mixed tumor) show that 100 per cent of the patients survived and were free from symptoms for five years. A few of these patients were operated upon more than once, and about half of them were treated by irradiation sooner or later, some of them for recurrence. In the case of a woman with a bilateral mixed tumor, the tumor on the right side was removed by operation with resulting facial paralysis, and the tumor on the left side by irradiation without injury to the facial nerve.

On the basis of these observations the following conclusions are drawn:

The malignant tumor of the parotid gland and the tumor of the parotid gland which is suspected to be malignant should first be thoroughly irradiated. In this way a malignant lymphoma may be recognized as such and, at the same time, cured. If the malignant parotid tumor recedes to at least half its original size within six weeks after the irradiation, the irradiations should be continued. When a small residual tumor remains after repeated roentgen irradiation, radium therapy may be used in addition. If the malignant tumor recedes to only a slight extent after the first irradiation, total extirpation should be done without further pre-operative irradiation and, because of the great frequency of recurrence, the operation should be followed by 1 immediate and several later prophylactic irradiations. A recent recurrence is destroyed most completely and permanently by irradiation. Irradiation should be given first also in cases of older recurrences even when, because of its histological character, the primary tumor is known to have been only slightly sensitive to irradiation. For recurrences with only slight sensitivity to irradiation, surgery should be employed

so far as possible. In cases of inoperable malignant parotid tumors intensive roentgen irradiation should always be given first and should be followed by partial extirpation and subsequent implantation of radium when these procedures are possible and seem promising. In the advanced stage, facial paralysis produced by the operation is of no importance as the malignant tumor itself leads to facial paralysis. A radical procedure is most effective in relieving the often almost intolerable pain. The development of distant metastases can be arrested only by irradiation.

The benign parotid tumor, while still young, is best treated by irradiation. When a benign tumor comes for treatment after it has been present for several years, as is usually the case, its size, location, and mobility must be taken into consideration in judging whether it can be removed surgically without injury to the facial nerve. The surgeon must determine also whether injury to the facial nerve may be caused by the deformity produced by the tumor. Steady growth, even though slow, seems to render it advisable to operate early with the risk of causing partial injury to the facial nerve in order that the greater injury which would be done by a later operation may be avoided. In every case in which an operation is performed for a benign tumor of the parotid gland postoperative irradiation should be given for the prevention of recurrence which is very frequent and has a tendency to become malignant. (HINTZE) LOUIS NEUWELT, M D

### EYE

O'Day, K. Operations for the Relief of Trichiasis and Cicatricial Entropion. *Australian & New Zealand J. Surg.*, 1934, 4, 23.

This article is based on the results of nearly 800 operations for trichiasis and entropion which were performed at the British Ophthalmic Hospital in Jerusalem. The pathological anatomy consists of one or more of the following conditions: (1) trichiasis, (2) cicatricial entropion, (3) blepharospasm, (4) rounding of the posterior lip of the free palpebral margin, and (5) narrowing of the palpebral fissure.

Operations for correcting the deformity of the lids may be divided into 2 main groups: (1) those in which the lashes are pushed away from the globe, and (2) those in which the attempt is made to rotate the whole lash-bearing area outward. To the first group belong the Van Millingen, Jaesche-Arlt, and Spencer-Watson methods, and to the second group the Snellen, Hotz-Anagostaki, Panas, and Burrough methods. Experience in Jerusalem has shown that most cases can be dealt with successfully by the Van Millingen operation, but for severe grades of entropion Snellen's operation is required and for trichiasis confined to the ends of the lids the Spencer-Watson operation is best.

The following instruments are necessary: a small scalpel, a pair of curved and a pair of straight scissors, a pair of conjunctival fixation forceps, a pair





## SURGERY OF THE HEAD AND NECK

of the infection, the extent of the bone involvement, the nature of the organisms, the presence or absence of blood stream infection, the general intoxication, and the response of all of the organ systems. The specific treatment of the meningitis is only one part of the treatment. No form of treatment directed against the meningitis alone can save life in all cases.

JAMES C. BRASWELL, M.D.

### NOSE AND SINUSES

Cooper, K. G. Plasmocytoma and Rhabdomyoma of the Paranasal Sinuses. Pathological and Surgical Considerations, Report of Cases. *Arch. Otolaryngol.*, 1934, 20, 329.

The author is of the opinion that solitary plasmocytoma and multiple myelomata should be classified with the malignant lymphomata. He reports two cases of solitary plasmocytoma and one case of rhabdomyoma of the paranasal sinuses. Of the thirty-two plasmocytomata reported in the literature to date, the majority were found in the upper respiratory tract.

Operation with postoperative irradiation seems to give the best results.

JAMES C. BRASWELL, M.D.

### MOUTH

Perussia, F. Radiotherapy of Cancer of the Mouth (La radioterapia del cancro della bocca). *Radiol. med.*, 1934, 21, 921.

Perussia presents statistical tables which show that in cases of cancer limited to the margin and dorsum of the anterior part of the tongue, the gums, and the lower maxillary bone the results of radiotherapy and those of surgery are about the same, and in the cases treated by irradiation the mortality is lower as there is no operative mortality. In cancer of the lips, the palate, and the floor of the mouth the results of radiotherapy are considerably better than those of surgery. For operable cancers of the cheeks, the base of the tongue, and the tonsils, radiotherapy is distinctly superior to surgery, whereas for operable metastases in the glands of the neck surgery is decidedly superior to radiotherapy.

The limits of cure have been definitely increased by radiotherapy. Pfahler says that from 50 to 75 per cent of cases of cancer of the mouth could be cured if thorough radiotherapy could be given in the beginning of the disease, but that education of both the public and physicians is necessary for early diagnosis. In cases without glandular metastases the incidence of cure persisting after five years is 40 per cent, whereas in cases with glandular metastases it is only 10 per cent. There are, of course, cases which cannot be treated even with severe sepsis, therapy. Among these are cases seen in advanced cases with phlegmons such as are seen in advanced carcinoma of the cheek and the floor of the mouth, and cases with far advanced cachexia.

Biopsy is important as the radiosensitiveness of the different types of cancer of the mouth varies

greatly. Surgery is to be preferred for small cylindromata of the palate, carcinomata with very highly differentiated cells and slow development which are made up chiefly of corneal pearls, and adenocarcinomata. Radiotherapy is to be preferred for lympho-epitheliomata, carcinomata with less highly differentiated cells and numerous and atypical mitoses, and the lymphosarcomata and the sarcomata made up of small round cells, which are frequently seen in the tonsils. The technique of radiotherapy indicated depends on the radiosensitiveness of the tumor in the particular case.

As the majority of cancers of the mouth are prickly-celled epitheliomata which are very resistant to radiotherapy, they should be given divided doses of strongly filtered rays of short wave length. The doses should be as large as possible without causing injury to the normal tissues. While it is impossible to administer a uniform carcinoma dose, the dose of from 3,500 to 4,500 r recommended by Coutard may usually be given for mucous membrane and skin epitheliomata. In cases of very sensitive tumors, such as sarcoma of the tonsil, it is not necessary to use Coutard's technique as good results can be obtained with ordinary deep roentgen therapy. Treatment with a single massive dose of roentgen rays is now rarely used in cancer of the mouth except for very small carcinoma of the lip. The dose of radium is about 1 or 2 mcd given by intratumoral fixation of needles. In many cases the combination of external roentgen therapy and intratumoral radium therapy has proved very effective. In some cases radionecrosis is unavoidable. Of 375 cases treated with radium in the period from 1928 to 1933, it occurred in 23. The fact that it is most frequent after the intratumoral use of radium and in patients whose mouths are in poor condition suggests that it may be caused by infection. Its incidence is reduced by a careful technique and hygienic care of the mouth.

AUDREY GOSS MORGAN, M.D.

### PHARYNX

Bailey, C. W. Modern Surgery in Diphtheria. Observations on 6,011 Cases. *Arch. Otolaryngol.*, 1934, 20, 162.

The most proximal sites of respiratory obstruction encountered in diphtheria are the oropharynx and hypopharynx. Cervical edema appears rapidly and often causes complete obstruction of the lower part of the pharynx. The only means of real relief in such cases is an orderly tracheotomy.

The next type of obstruction is that of the larynx, trachea, and bronchi. Routine inspection of the larynx by direct laryngoscopy should be done in every case of croupy cough or labored respiration. All pseudomembrane should be removed by aspiration through the laryngoscope. If necessary, a long aspirating tube should be passed through the larynx to remove pseudomembrane from the trachea and bronchi. This is preferable to the use of the bronchoscope. During the first twenty-four to

thirty-six hours the membrane may require removal several times as it often re-forms in from six to twelve hours. Although the use of the O'Dwyer tube often saves life, it is dangerous and therefore undesirable. If intubation is necessary it should be performed by the indirect method and should never be done until laryngoscopy and aspiration have been performed. The tube is usually left in place for five days and then removed and left out if possible.

The third type of respiratory obstruction is diphtheritic bronchopneumonia. This is usually associated with tracheobronchial diphtheria and is always fatal as no effective therapy is known. It is usually due to obstruction of the terminal bronchioles from hypertrophy of the tracheobronchial membrane.

The relief of "chronic tube cases" has been a serious problem since the invention of the O'Dwyer tubes. The essential lesion is a diphtheritic stenosis of all or part of the larynx. Two methods of treatment are available. In the first method a larger caliber tube is inserted and left in place for from two to four weeks. If at the end of that time, the tube can be left out for two days without recurrence of symptoms, cure usually results. If this method fails, the second method, low tracheotomy, should be done without delay. The laryngeal tube should be removed and the patient made to breathe through the larynx by gradually plugging the tracheotomy tube. After the tube has been completely plugged for three or four days and the patient is doing well, the tube should be removed and the wound closed.

Tracheotomy is now necessary comparatively seldom. It is indicated only in pharyngeal obstruction caused by excessive cervical edema and in a few "chronic tube cases." In acute laryngeal diphtheria it is rarely performed, but is much safer procedure than intubation without preliminary laryngoscopy and aspiration. It is safer also than leaving the intubated patient unprotected at home or far out in the country.

If diphtheria bacilli persist in the throat after recovery from diphtheria the tonsils and adenoids should be removed.

A persistently positive nasal discharge should be treated by an ephedrine spray and nasal irrigation with normal salt solution. If the secretion is still positive after ten days of this treatment, the focus will usually be found in the accessory sinuses and should be drained surgically. A persistently positive discharge from the ears should be treated in the usual manner but surgical intervention is usually indicated if improvement does not result in from three to six weeks. ARTHUR S. W. TOWNSEND, M.D.

#### WICK

Moss, U. Boyce, F. F. and McFetridge, E. M. Hyperthyroidism in the Negro, with an Analysis of Seventy Three Cases. *Ann. N. Y. Acad. Sci.* 1934, 4: 450

Surgically the Negro represents a definite problem. The mulatto is a very poor surgical risk, while

the black Negro is a very safe surgical risk. The southern Negro has poor hygienic surroundings, and as he is prone to disregard early symptoms, he usually presents an advanced pathological condition by the time he enters the hospital.

Goiter in general and toxic goiter in particular is relatively rare in the South. In the New Orleans Charity Hospital, where the admissions average 40,000 annually, the authors were able to collect only 33 surgical cases of goiter. One hundred and forty-eight of the cases of surgical goiter were those of Negroes and 73 of the latter were toxic.

In the Negro, hyperthyroidism is usually secondary to a simple diffuse or colloid goiter. The toxic manifestations are less severe, the basal rate is lower and the postoperative reactions are less serious than in white persons.

In the total series of 34 surgical cases of goiter cited by the authors the mortality was 7.6 per cent. In the cases of white persons it was 5.7 per cent and in the cases of negroes it was 10.9 per cent. The total mortality in the cases of males was 5.5 per cent, and the total mortality in the cases of females, 6.5 per cent. The mortality of colored males was 15 per cent, and the mortality of white males, 1 per cent. The mortality in the total number of cases of toxic thyroid disease was 1.7 per cent. In the cases of white persons, 0.9 per cent and in the cases of Negroes 18.3 per cent.

Although hyperthyroidism is less severe in Negroes than in white persons, its mortality is higher in the Negro. This is explained by the Negro's frequent delay in seeking treatment, cardiovascular complications on a thyrotoxic or sympathetic base, the greater frequency of toxic goiter in the mulatto who is a poor surgical risk, and the greater technical difficulty of the operation due to the advanced stage of the condition.

The authors state that the incidence of toxic goiter in the Negro is rising. In 1930 the number of cases admitted to hospitals was 4 times greater than the number admitted during the period from 1927 to 1930.

The treatment indicated for Negroes is the same as that indicated for white persons, but the Negro must be educated to seek treatment earlier.

FRANK S. MONTANA, M.D.

Cottrell, R. B. Eye Complications in Exophthalmic Goiter. *Ann. Surg.* 1934, 100: 244

There are general types of ocular complications in exophthalmic goiter. Those of the less common type are cataract and lensular opacities due to parathyroid insufficiency and tetany following thyroidectomy. Those of the more frequent type are related to exophthalmos and its complications. This report is based on 4,115 operatively treated cases of exophthalmic goiter and primary hyperthyroidism. Of 5,483 operations, 6 (0.1 per cent) were followed by parathyroid tetany. In 10 cases the tetany was acute and transient and no eye complications developed. Of the 6 cases in which the tetany was

# SURGERY OF THE HEAD AND NECK

chronic, there were no eye complications in 2, lens opacities developed in 2, and frank cataracts were formed in 2. In 1 of the cases of lens opacities the tetany was fatal, and in the other both eyes were ultimately lost from progressive exophthalmos. In the 2 cases of frank cataract the first visual signs developed after twelve and eighteen months respectively and the cataracts matured in two and a half and three years respectively.

Exophthalmos is one of the cardinal signs of exophthalmic goiter although it occurs also in many other conditions. The cause of exophthalmos in exophthalmic goiter is still unsettled. The facial appearance, simulating fright, suggests a sympathetic influence, and the rapidity with which the exophthalmos frequently disappears suggests a nervous rather than an anatomical origin.

To determine the incidence of exophthalmos in exophthalmic goiter the author reviewed the records of 800 consecutive cases of the latter condition. Exophthalmos was present in 364 (46 per cent) of these cases and absent in 421 (52 per cent). In the records of 15 (2 per cent) of the cases the presence or absence of exophthalmos was not stated. Of the 364 patients with exophthalmos, 9 had a unilateral and 13 an asymmetrical exophthalmos. There was no relation between the severity of the disease and the degree of the exophthalmos, but a definite relation was apparent between the duration and degree of the proptosis.

Of the 800 patients, 720 (90 per cent) were females. Ten times as many females as males had exophthalmos. The age incidence of exophthalmic goiter followed the general age incidence of exophthalmic goiter. The ages ranged from two years and eleven months to seventy-six years.

Of the 364 cases with exophthalmos, the exophthalmos was completely relieved in 183 (50.3 per cent), improved in 48 (13.2 per cent), and not improved in 79 (21.7 per cent). In 4 (1.1 per cent) it increased. In 50 (13.7 per cent) the outcome as regards the exophthalmos was not determined.

Of the 183 cases in which the exophthalmos disappeared, the cure was complete within a year in 165.

In 26 cases, exophthalmos developed after the operation. In 10 of these the toxicity persisted or recurred, in 12, the basal metabolic rate was normal, and in 4, myxedema supervened. The myxedema was relieved by the administration of thyroid extract.

Of the 4 patients whose exophthalmos increased after operation, 2 were relieved of the hyperthyroidism and 2 remained toxic. A number of procedures have been advocated for the treatment of extreme exophthalmos. Cervical sympathectomy and plastic operations performed on the external canthus have been of little benefit. Naffziger has developed an intracranial operation in which the roof of the orbit and the inner margin of the foramen opticum are removed.

FRED S. MODERN, M.D.

Roussy, G., Huguenin, R., and Welti, H. The Histological Structure of the Thyroid Remaining After Cure of Basedow's Disease by Subtotal Thyroidectomy (Structure histologique de la thyroïde restante après guérison de la maladie de Basedow par thyroïdectomie subtotale). *Ann d'anat path.*, 1934, 11: 555.

In two cases of well-developed exophthalmic goiter cured by subtotal thyroidectomy the authors were able to make a histological examination of tissue from the portion of the thyroid gland remaining. In one case this examination was made fourteen months, and in the other five years, after the thyroidectomy. In both cases the second operation was performed for the removal of an unsightly scar. The case histories are reported in detail. Both patients had severe Graves' disease and both were apparently completely cured. In both cases the portion of thyroid remaining presented the typical microscopic appearance of the hyperplasia seen in so called exophthalmic goiter. Photomicrographs made in the first case are shown.

The authors conclude that the symptoms of exophthalmic goiter are due, not to a dysfunction, but to the hyperplasia. In support of this conclusion they cite the fact that the amelioration of the symptoms under iodine medication occurs concomitantly with a reduction of the hyperplasia.

MAX M. ZINKNER, M.D.

Zuppinger, A., and Rohrer, C. The Clinical Aspects and Treatment of Struma Maligna. A Report on 101 Cases Treated in the Period from 1918 to 1933 (Zur Klinik und Therapie der Struma maligna. Bericht ueber 101 Faelle von 1918-1933). *Acta radiol.*, 1934, 15: 523.

The authors review 101 cases of malignant struma which were referred to the Roentgen Institute of the University of Zurich for irradiation treatment in a period of fifteen years. They state that in the eastern part of Switzerland thyroid sarcoma is almost as frequent as thyroid carcinoma and Langhans' struma together. The cases are decidedly unfavorable. Of the patients whose cases are reviewed, only 6 could be operated upon radically, and of the latter, only 3 have remained free from symptoms since the operation. In only 48 of the 101 cases was it possible to complete the treatment. In the others only palliative treatment could be attempted. A comparison of the different methods of treatment used shows that operation with postoperative irradiation gave no better results than irradiation alone even though in the cases treated with irradiation alone the prognosis was less favorable than in the cases treated surgically. Irradiation with fractional doses over an extended period yielded considerably better results than the method used in the beginning as it rendered complete treatment possible in a considerably greater number of cases. In some cases in which the condition was far advanced it resulted in freedom from symptoms, but the length of time that has elapsed since the treat-

ment is still too short to permit the assumption that a permanent cure has been obtained.

Van Poole, G. McD.: Tuberculosis of the Larynx. *Arch. Otolaryngol.* 934, 20, 52.

Laryngeal tuberculosis is almost invariably associated with severe chronic pulmonary tuberculosis. It is the result of constant contamination of the mucous membranes by bacilliferous sputum. As a rule the more severe the pulmonary disease, the more severe the laryngeal disease. Manson distinguishes the following stages of laryngeal involvement: (1) infiltration, (2) ulceration, (3) perichondritis and (4) tumor formation. Of these, ulceration is the most common and the most distressing. The ulcers appear to occur most frequently on the vocal cords and especially on the vocal processes. The lesions usually spread to the ventricular bands, arytenoids, and the base of the epiglottis. In a downward direction, they spread to the trachea and large bronchi.

The early symptoms of laryngeal tuberculosis are those of interference with phonation. Hoarseness, change of the pitch of the voice, "scratching" of the throat, and a paroxysmal unproductive cough are common. Later symptoms are pain on phonation or deglutition, reflex cough, and the peculiar sibilant whisper which is the unmistakable sign of the disease. In severe cases, excruciating pain on swallowing, severe dyspnea, and air hunger often occur. In the late stages labored respiration and asphyxia usually supervene as the result of atelectasis of the

small bronchioles with atelectasis of large areas of the lungs.

This report is based on a study of 304 cases of laryngeal tuberculosis in males and 56 cases in females which were observed during a period of five years. The former constituted 85 per cent of a series of 304 cases, and the latter 9 per cent of a series of 136 cases of pulmonary tuberculosis. The total number (440 cases) constituted 89 per cent of the total series of 1,094 cases of pulmonary tuberculosis.

The first principle of treatment is the establishment of adequate therapy for the pulmonary lesion. Of 158 cases treated by pneumothorax during the preceding year at the author's institution, active laryngeal involvement was found in only 4. Before treatment by pneumothorax had been begun in these 3 cases, laryngeal tuberculosis was present in 33. The cardinal principle of local treatment is vocal rest. Among the various palliatives employed for the relief of pain and dysphagia are cocaine hydrochloride, ethyl amino benzoate, lozenges, and ice chips. The injection of 85 per cent alcohol into one or both supralaryngeal nerves is practiced extensively in refractory cases. In the majority of cases electrocauterization is by far the most satisfactory local measure. By this method, vascularization of the lesion and fibroplastic replacement are promoted. In cases which are unsuited for crural palliation, every possible procedure that gives promise of relief should be employed.

ARTHUR B. W. TOWNSEY, M.D.

# SURGERY OF THE NERVOUS SYSTEM

## BRAIN AND ITS COVERINGS, CRANIAL NERVES

Russell, W. R. The After-Effects of Head Injury.  
*Edinburgh M. J.*, 1934, 41: 120

This article reports the findings in 200 cases of head injury in which a follow-up examination was made on an average of eighteen months after the acute stage. All of the observations were made by the author who had studied each case during the acute stage of the illness.

As the incidence of after effects was found to be highest in the older patients, Russell concludes that age is the most important single factor to be considered in estimating the prospects of recovery.

The most common post concussion symptoms were (1) headache, (2) dizziness, (3) loss of memory or mental ability, (4) nervousness, (5) disturbances of behavior or personality, and (6) sleeplessness.

One of the most astonishing findings of the author's study was that 35 per cent of persons suffering from post concussion disturbances develop epilepsy.

The relationship between the severity of the injury and the duration of incapacity was fairly well indicated by the duration of the complete loss of consciousness.

The patients who sought financial compensation were much slower to return to active work than the others.

The author concludes that the presence or absence of a demonstrable fracture of the skull is of little importance in the estimation of the severity of the injury.

The treatment employed for the post concussion syndromes is described. R. GLEN SPURLING, M.D.

Puech, P., and Stuhl, L. Adenomata of the Hypophysis. Roentgenological Appearance of the Sella Turcica (Adénomes de l'hypophyse: aspects radiologiques schématiques de la selle turcique). *Presse méd.*, Par., 1934, 42: 1131.

Two special examinations, namely, ocular and roentgenological, are essential for the early diagnosis of tumors of the hypophysis.

An adenoma of the hypophysis passes through two anatomical phases, one within and the other outside of the sella turcica. During the first phase the tumor may remain for a long time microscopic. There is no change in the sella and, when the adenoma is of the acidophile variety, the condition is manifested only by an acromegalic syndrome. With an increase in the size of the tumor, the sella becomes distended and the adenoma pushes upward to become suprasellar or downward to become infrasellar and invade the sphenoid fossa.

In spite of the variations in the shape of the normal sella, experience has shown that a certain roentgenological appearance of the sella is associated with each variety of adenoma. In cases of chromophobe tumor the sella turcica is distended in all diameters and the clinoid processes are thinned. There are no bony hypertrophies such as are associated with acromegaly. On the contrary, the walls of the sella are atrophic.

In cases of acidophilic adenoma the appearance of the sella is quite different. So distention which occurs chiefly in the vertical diameter are added hypertrophy and elongation of the clinoid processes. Particularly the anterior process is prominent.

Tumors of the posterior cranial fossa may be confused with hypophyseal tumors because occasionally they cause an acromegalic syndrome. However, the syndrome develops late, several years after the symptoms of intracranial tumor. Moreover, the deformity consists of destruction of the quadrilateral plate (clivus) of the sphenoid. In doubtful cases ventriculography clears up the diagnosis. Particularly difficult to distinguish from hypophyseal tumors is retrochiasmatic arachnoiditis. In this condition the sella is normal.

The roentgenographic images are of some aid in foreseeing the operative difficulties that may be encountered in cases of acromegalic acidophilic adenoma. These difficulties are caused by the hypertrophied clinoid processes.

The article contains twenty-one illustrations.

ALBERT I. DE GROOT, M.D.

Adson, A. W. Operability of Brain Tumors. *Ann. Surg.*, 1934, 100: 241.

Many physicians still hold the opinion that all cases of brain tumor are hopeless. While many brain tumors are inoperable because of a malignant structure or inaccessibility, a fair group can be removed completely and a larger group can be removed subtotally or by the intracapsular method. The increased intracranial pressure produced by the inoperable tumor is frequently relieved by suitable decompressions. The interval of relief is often increased by the aid of radiotherapy. Surgical treatment of brain tumors is not a hopeless and worthless procedure.

Until the last two or three decades, most general surgeons were more concerned with the technique of craniotomy than with the problems of the treatment of tumors. This fact was responsible for the development of the new surgical specialty known as "neurosurgery." The neurosurgeon is qualified to evaluate clinical, neurological, and laboratory findings and to execute the accepted modern surgical procedures in the treatment of tumors of the brain.

In order to evaluate the operability of brain tumors, Adson reviewed a series of 220 consecutive cases of brain tumor operated on at the Mayo Clinic in the eighteen months from April, 1931 to September 1933. The tumor was removed completely in 9 and subtotally in 99. The latter included 32 cases of pituitary tumor and 19 of neurofibromas of the acoustic nerve.

Many surgeons have changed the anesthetic employed from time to time. Adson has always returned to the use of ether as he has learned that drop ether inhalation can be employed with safety and without causing a rise in the blood pressure if the ether administered on a open mask held over a Magill tube which has been introduced through the nose or mouth into the trachea. The intra-tracheal tube is inserted after the patient has been anesthetized with ethylene or ether and prior to preparation of the surgical field.

The surgical field, which does not always include the entire head, is shaved and then cleaned with soap and water and solutions of ether and alcohol preliminary to the application of a coat of a 7,000 alcoholic solution of merthiolate. The wound is further protected by suturing a sheet of sterilized rubber dam about the proposed surgical field. The rubber dam is of sufficient size to extend from the head over the instrument table.

In the closure of the wound the best results are obtained by careful approximation of the bone flap, periosteum, muscles, fascia, galea, and skin by interrupted silk sutures. Burr openings are filled with bone dust which has been made into pledgets by wrapping animal membrane about ground bone obtained at the time of the opening. Drains are rarely used.

Most surgeons prefer to complete the operation in stages and, if necessary, resort to blood transfusion during the operation. In emergency solution of crania may be substituted for blood.

Surgical tumors of the brain are classified into large groups, the one including encapsulated and circumscribed tumors, and the other diffuse infiltrating and inaccessible tumors. The encapsulated accessible tumor is removed by surgery most easily but the infiltrating tumor when situated in a silent area, can also be removed by including the brain about it. Radical resections of diffuse infiltrating tumors are avoided if removal of the tumor may result in hemiplegia. Adson prefers to obtain a shorter period of relief with preservation of more normal function than an extended, indefinite period of relief with the possibility of apastic hemiplegia.

#### SPINAL CORD AND ITS COVERINGS

Steen E. L. The Relief of Intractable Pain by the Intraspinal Injection of Alcohol. *Am J Surg* 1934, 45, 7.

This article is based on fifty intraspinal subarachnoid injections of 95 per cent alcohol for the relief of excruciating pain of chronic nature. Twenty of

the injections were given in nineteen cases of carcinoma.

The specific gravity of 95 per cent alcohol is from 806 to 810 as compared with the specific gravity of cerebrospinal fluid which is 1.007. As alcohol will float upon cerebrospinal fluid its spread can be limited to the desired segment by having the patient flex the spine laterally. The level of the injection is determined from a consideration of the somatic and sympathetic pathways involved in the particular case. The patient must be placed in the correct position with the center of the area to be affected by the alcohol uppermost in the horizontal level. This position may be attained by flexing the patient over pillows with the head always lower than the part of the spine to be injected. A fine lumbar puncture needle should be used and a free flow of clear cerebrospinal fluid obtained. Between 4 and 16 minims of sterile 95 per cent alcohol with specific gravity below 816 are injected slowly with a tuberculin syringe. The dose depends upon the location of the injection and the effect desired. From three to four minutes should be taken to inject the alcohol without barbitage or the injection of air. The patient should retain the same position for at least ten minutes after the injection and then be placed flat in bed for two hours with the foot of the bed elevated from 4 to 8 in. He should not sit up for four hours after the injection and should remain in bed twenty-four hours. The injection may be repeated after five or six days if the pain continues or if it is necessary to inject the other side in cases of bilateral pain. The puncture should never be made above the first thoracic vertebra. The maximum amount of alcohol injected between the first and second thoracic vertebrae should not exceed 8 minims. It must be remembered that the pain may persist for as long as two weeks after the injection.

The author believes that the intraspinal injection of alcohol is practical and safe when it is done properly. It usually relieves intractable pain. It may cause only partial anesthesia and does not paralyze muscles. ROBERT ZOLLINGER, M.D.

Ley A. The Surgical Treatment of Syringomyelia (Le traitement chirurgical de la syringomyélie). *Bull de chir de Bordeaux*, 1934, 6.

The author reports four cases of myelopathic cavities with the syringomyelic syndrome which were operated upon by the Elsberg-Pruessner method. The first two were observed by him. The first case, in Dorpat, Estonia, and were reported to Pruessner. *Surgical Neuropathology* published in 1933. The last two were operated upon by Gartner of Cleveland.

Ley has collected from the literature eighty-eight cases of intramedullary cavities in which the Elsberg-Pruessner operation was performed. He analyzes them statistically, draws general conclusions from the results, and discusses the trends of opinion as to the comparative efficiency of surgical and X-ray treatment.

# SURGERY OF THE NERVOUS SYSTEM

## PERIPHERAL NERVES

The results of operation vary markedly and are sometimes paradoxical. This is explained by the differences in the causes and pathological characteristics of the cavities. Further pathological knowledge is needed for the differential diagnosis of the myelopathy characterized clinically by the syringomyelic syndrome. Of the cases reviewed, 70 per cent showed improvement, 13 per cent no improvement, and 17 per cent aggravation of the condition six months after the operation. In the cases of aggravation there were three deaths. The corresponding percentages for the late results which were reported in only 17 cases, were 64.7, 11.8, and 23.5 per cent. The unfavorable results increased with the passage of time. The previous duration of the disease had only a slight effect on the immediate results, but a marked effect on the late results. The symptoms most amenable to surgical treatment are the sensory and trophic disturbances, pain, and the signs of compression of large nerve tracts. Pareses of the peripheral type and muscular atrophy are seldom relieved.

Levy believes that in cases of the syringomyelic syndrome in which the diagnosis is made with certainty, treatment should be guided by the hydrodynamic conditions of the cerebrospinal fluid. If spinal block, even partial, is present lumpectomy should be done and the lesion adequately treated. If a cavity is found, it should be drained and its effects carefully noted. If there is the slightest aggravation of the symptoms if spinal block appears, or if the patient does not show improvement in a reasonable time, surgical treatment should be undertaken. In grave advanced, or rapidly progressive cases, especially those with marked trophic changes, surgical intervention should not be delayed unless irradiation produces marked improvement within a short period of time. No single sign is of special value in the prognosis. The Flisberg Puusepp operation has resulted beneficially in about two-thirds of cases of less than four years' duration. In about one fourth of such cases its results have been unfavorable. In cases of more than four years' duration the number of cases in which the condition is made worse by the operation rises to more than 50 per cent. However, it must be remembered that in cases of such long duration irradiation therapy is completely ineffective.

The eighty-eight cases treated surgically are summarized in a table. The article has illustrations and an extensive bibliography. M. E. MORSE, M.D.

Bergstrand, H. A Malignant Tumor of the Left Tibial Nerve. *Am J Cancer*, 1934, 21, 588

The author reports a case of malignant tumor of the left tibial nerve associated with multiple pulmonary tumors. The patient, a man thirty-one years of age, first noted pain over the distribution of the tibial nerve. This was followed in six months by a palpable tumor in the left popliteal fossa. Eighteen months after the onset of the pain there was paresis of the flexor muscles of the toes, and twenty-two months after the onset symptoms of pulmonary and cerebral lesions appeared and were followed by death.

Autopsy did not include examination of the head. It revealed a fusiform enlargement of the left tibial nerve 5 or 6 cm below the branching of the peroneal nerve and multiple tumors in both lungs and pleural cavities.

On gross examination the tumor of the nerve was found to be grayish white and fairly soft. The cut surface presented yellowish areas and a few small hemorrhages. The nerve trunk could not be distinguished. Microscopic examination showed that the tumor had forced the nerve trunks apart. The tumor consisted largely of vessels and interstices filled with fat loaded xanthoma like cells. The vessel walls were composed of a thin layer of endothelium surrounded by loose nucleated connective tissue which in turn was surrounded by a thick layer of hyaline connective tissue. The residue consisted of empty nerve fibers exhibiting a proliferation of the Schwann cells. These proliferating sheaths of cells were characteristically split by membranes of connective tissue. Proliferations of the neurilemma strongly suggested those of a neuroma. The hemangioma infiltrated the surrounding muscles as well as the nerve trunk.

The growths in the lungs were composed of cells with closely lying oval or slightly elongated nuclei arranged in rosettes. The cell clusters were separated by connective tissue carrying capillaries.

As the tumor in the popliteal space was the first to cause symptoms, the author believes that this tumor was primary. The cells of the pulmonary growths showed no characteristics indicating that they were derived from vascular tissue. Bergstrand therefore suggests that the proliferation of the cells of the sheath of Schwann was the source of the pulmonary metastases.

O. W. JONES, JR., M.D.



# SURGERY OF THE CHEST

## CHEST WALL AND BREAST

Tseng, D. Acute Purulent Mastitis During Lactation (La mastite purulente aigüe de allaitement) *Rev. Med. de Genev.* 934, 6, 423.

The author reports twenty cases of acute purulent mastitis occurring during lactation. He describes the bacteriological and pathological findings and the treatment. Fifteen of the patients are puerperae. The principal bacteria found are staphylococci and streptococci, but other organisms were also present. For cosmetic reasons, the incision for drainage was usually made at the edge of the breast. Cure resulted in all of the cases. The duration of the infection ranged from eleven to fifty nine days.

A. Louis Roux, M.D.

Moulonguet Doléris, P. The Diagnosis of Cancer of the Breast (Diagnostic du cancer du sein) *Gynécologie*, 934, 33, 345.

In its early stages cancer of the breast may simulate a number of conditions, notable among which are:

Necrosis of cysts of the premenstrual fat trauma, but occasionally it occurs in large and pendulous breasts in the absence of history of trauma. It is characterized by ecchymosis dating as far back as recent injury. The lesion is superficial, but an exploratory incision is often necessary to establish this fact with certainty.

Chronic infectious mastitis. As this is often present at the menopause, it creates a difficult diagnostic problem. If, however, there is frequently history of antecedent acute infection which is of aid. A diagnostic incision should be made when there is doubt as to the nature of the condition.

3. S. phyllis and tuberculous. Isolated cysts. These are formed very infrequently and are usually situated in the center of the breast. Exploratory puncture is a comparatively simple procedure of great diagnostic value.

4. Mammary engorgement occurring in nervous and irascible women. Sometimes an incision must be made for inspection and microscopic section.

5. Generalized dystrophy (Reclus' disease) which is often bilateral and disseminated throughout the whole gland structure.

The localization of the cancer as when the lesion involves the axillary prolongation or is at the periphery of the gland and firmly fixed to the chest wall, may also lead to error.

The ulcerative types, particularly Paget disease of the nipple, should be recognized early but are frequently mistaken for chronic eczema.

Bleeding from the nipple may be due to benign papillomatous tumors. Therefore it does not necessarily indicate that a tumor mass is malignant.

Apparently adenomatous tumors of the breast in women over forty years of age should be looked upon with great suspicion as they are usually malignant. Roentgenography and transillumination of the breast offer little help in the diagnosis.

The authors believe that incision and examination of the suspected area by the naked eye is of the greatest value. The surgeon should be ready to do a complete operation if malignancy is found. A microscopic examination should also be made. The authors are of the opinion that by a combination of the two methods and an early diagnosis it is possible to cure most cases of cancer of the breast.

MARIE IV. POOLE, M.D.

## TRACHEA, LUNGS, AND PLEURA

Pottenger F. M. Non-Operative Versus Operative Measures in the Treatment of Pulmonary Tuberculosis. *Am. J. M. Sc.* 934, 123, 69.

According to the author the following types of pulmonary tuberculosis will heal fairly regularly without operative assistance:

Early limited lesions of either the proliferative or the exudative type.

More extensive proliferative lesions involving one or both lungs which have not formed extensive metastases or destructive processes with multiple cavitations. While small cavities of this type may be expected to heal as a rule without surgical measures, the healing of large ones without operative aid is more doubtful especially when the cavities are multiple. Whether or not such lesions will heal depends to a considerable degree on the extent of the injury which has been done to the lung tissue and the extent to which the necessary compensatory changes between the lung volume and the intrathoracic space may be made.

3. Exudative lesions more extensive than those of Group 1, with or without cavity formation, provided the non-infected lung tissue can take on the required shift of its shifting is required by the compensation necessary and provided other limiting structures are able to accommodate themselves to the reduced lung volume. The early formation of cavity in exudative tuberculosis will not prevent healing unless the cavity is held open by pleural adhesions and dried mediastinum or is so located that it cannot close.

4. Exudative lesions which are accompanied by extensive teleostasis. These will usually heal even when they are accompanied by high temperature which requires several months to reach normal.

# SURGERY OF THE CHEST

According to the purely scientific viewpoint, there are practically no early cases that regularly require operative assistance. However, in cases of more advanced disease there are several types of lesion which cannot be depended upon to heal without operative aid. Among these are

1. Comparatively small lesions with a cavity which is held open by pleural adhesions and is prevented from closing because the unaffected lung tissue is not able to make the necessary compensatory changes. Examples of such are apical or sub-apical cavities covered by a pleural cap, especially those associated with fixation of the upper mediastinum.

2. Active lesions which continue to form metastases unduly long in spite of carefully followed non-operative treatment.

3. Lesions in which a destructive process is seriously threatening cavity formation. When cavity formation threatens during the course of chronic tuberculosis it should be prevented by collapse if possible.

4. Lesions which are prevented from healing by mechanical hindrances. These include small cavities situated so that their walls cannot collapse, such as cavities in the apex covered with a pleural cap, small cavities in dense scar tissue situated in any part of the lung, small cavities near the hilum or diaphragm, extensive infiltration, with or without cavity formation, in which the tissues are put under marked tension and the compensation necessary for healing cannot be made readily, large cavities with thick fibrous walls, and cavities in a greatly contracted lung with displacement of the mediastinum in which further compensation cannot be made.

Pottenger says that while, according to his experience, this grouping separates the cases which may be expected to heal under treatment by non-operative measures from those which require operative assistance, it does not represent the manner in which tuberculous patients are generally treated because operative measures are frequently found necessary to meet the exigencies under which the treatment is carried out.

EARL O. LATIMER, M.D.

Wood, H. G. Cystic Disease of the Lungs. *J. Am. M. Ass.*, 1934, 103: 815.

Congenital cystic degeneration of the lungs is an uncommon disease, but occurs much more frequently than has been suspected. Wood reports sixteen cases. He states that with modern diagnostic methods a roentgenological diagnosis should be made in a high percentage of cases. The greatest potential danger associated with the condition is secondary pulmonary infection. In cases in which there is a bronchial communication an attempt should be made to produce complete occlusion of such a communication favors advance of the disease. In some cases complete extirpation of fluid containing cysts has given excellent results. A number of patients who had infected cysts with bronchial communications were greatly benefited by bronchoscopic

aspiration followed by the injection of iodized poppy-seed oil. This treatment should be considered for all such cases. Diffuse, bilateral cystic degeneration of the so-called honeycomb type is not benefited by any form of treatment.

Heuer, G. J. The Development of Lobectomy and Pneumectomy in Man. *J. Thoracic Surg.*, 1934, 3: 560.

Rolandus in 1499 and Tulpus in 1624 performed lobectomies in cases in which the lung herniated through wounds in the thoracic wall. Between 1836 and 1880, similar operations were performed by Forde, Hale, Grinnell, and Richards.

The year 1880 marked the beginning of scientific experimental work on lobectomy and pneumectomy. Gluck, Block, and Schmidt began the work on dogs and rabbits. At first they operated without an aseptic technique, with disastrous results. Biondi in 1882, working first on normal animals and later on animals with lungs infected with tubercle bacilli, was more successful.

These early experiments were quickly followed by the contributions of Murphy (1898), Tiegel (1907), Friedrich (1907), Robinson (1908), Halsted (1909), Willy Meyer (1909), Robinson and Sauerbruch (1909), Mollgaard and Rovsing (1910), Schlesinger (1911), Garre (1912), Schepelmann (1913), Henschel (1914), Giertz (1914), and Kawamura (1914). As the result of their work negative pressure anesthesia was supplanted by positive pressure anesthesia, the high incidence of pleural infection was lowered by the application of the principles of asepsis, successful methods of treating the bronchial stump were developed, alterations in the pulse and heart action after pneumectomy were investigated, and the obliteration of the empty pleural cavity was found to occur through expansion of the remaining lung tissue. One investigator reported a true compensatory hypertrophy of the remaining lung.

Among later workers in this field were Cave, Dunn, Holman, Reichert, Rienhoff, Andrus, and the author. In the period from 1914 to 1923 new and more successful methods for closing the bronchial stump were developed. It was found that the main pulmonary vessels could be ligated with little or no alteration in the pulse and blood pressure and only a temporary change in respiration, that undue traction upon the lung during pneumectomy caused marked irregularity in the cardiac action that, in the dog, pleural effusion did not occur if infection was prevented that the large intrapleural cavity left after pneumectomy was rapidly obliterated, and that the compensatory enlargement of the remaining lung is not a hyperplasia but a simple expansion due largely to dilatation of the atria and the air sacs, other findings of importance were that pneumectomy will not seriously affect the probable duration of life, that it is followed by definite changes in the alveolar gases and in the blood gases together with a temporary increase in the red blood cells and the hæmoglobin to increase the oxygen-

carrying capacity of the blood and an increase occurs in the blood flow and pulse volume to compensate for the temporary decrease in the total lung volume.

After such encouraging experimental findings surgeons began a deliberate attack upon the lung of man. However, while the experimenters were perfecting an ideal operation on the normal animal, the surgeons, operating on men, were confronted with problems presented by disease of the lung which gave rise to a prohibitive mortality or serious complications. These problems led to the development of the multiple-stage operations, by, among others, Ballou, Senger and Graham.

As the result of the extraordinary interest in lobectomy and pneumonectomy in recent years new methods of procedure in both the one-stage and the multiple-stage operation have been developed. In the treatment of tumors of the bronchi and lungs by lobectomy or pneumonectomy the one-stage operation has become the operation of choice, whereas for the treatment of bronchiectasis the multiple-stage procedure is considered to be safer.

An attempt to visualize future progress in this field is hazardous. The trend will inevitably be toward the one-stage operation for bronchiectasis as well as for tumors. Accordingly there is need for further study of bronchiectasis to establish new indications for operative therapy.

J. D. VAN WILKINS, M.D.

#### HEART AND PERICARDIUM

Candrade, F. Wounds of the Heart (*Contusiones al pecho de las heridas del corazón*). *Rev. de ciruj. de Barcelona*, 1934, 4, 65.

Wounds of the heart involve the right and left ventricles with about equal frequency. Wounds of the auricles are more apt to cause dangerous hemorrhage than wounds of the ventricles. Unless the coronary arteries are divided, wounds of the interventricular septum are not so dangerous as wounds opening the cavities. Gunshot wounds are more dangerous than lacerated wounds, and stab wounds much more dangerous than needle punctures.

The results of wounds of the heart vary from instant death to disability so slight that the injured person continues to walk about. The clinical picture of serious wounds is characterized by precordial pain, pallor, shock, marked dyspnea, rapid shallow respiration, cyanosis, a fall in the blood pressure, and a weak, rapid, irregular, and sometimes imperceptible pulse. Frequently there is collapse and sometimes loss of consciousness. Bleeding may or may not occur from the wound.

Hemopericardium is suggested by an increased area of cardiac dullness, soft distant heart sounds, cyanosis, blueness of the lips, and marked dyspnea. X-ray examination will establish the diagnosis.

Aspiration of the pericardium to relieve pressure on the heart may prolong life until the heart can be exposed and sutured. I cardiorrhaphy a homeo-

shaped flap including the fourth, fifth, and sixth ribs and cartilages and hinged on the lateral side is made. The pericardium is opened, clots are removed, and the wound in the heart is closed by interrupted sutures of fine silk with care to avoid the coronary vessels.

The author reports in detail a case in which both ventricles and the interventricular septum were pierced by a stab wound and injury of the left pleural cavity and lung produced hemothorax and pneumothorax on the left side. The patient lived sixty-eight hours after cardiorrhaphy and died of bronchopneumonia in both lungs. A autopsy showed that the wounds of the heart had been closed satisfactorily and there had been no postoperative hemorrhage.

WILLIAM R. ALLEN, M.D.

#### MISCELLANEOUS

Colletti, D. A.: Traumatic Laceration of the Diaphragm. Hernia of the Stomach and Spleen (*Lacerazione traumatica del diaframma. Ernia dello stomaco e della milza*). *Arch. ital. di chir.* 1934, 25, 44.

The case reported was that of a man thirty-two years of age who was hurled a long distance in an automobile accident. He was unable to call for help and was not discovered until some hours later. On examination, the upper part of the abdomen was found distended and there was intense pain in the epigastrium. The base of the thorax was widened and the sternum pushed forward, the intercostal spaces being increased in width, more on the left than on the right side. The patient suffered from intense dyspnea and showed slight cyanosis. Respiration was short, superficial, and of the upper costal type. The picture suggested rupture of the diaphragm.

Laparotomy disclosed a long laceration in the left side of the diaphragm with herniation of the stomach and spleen into the thoracic cavity. The stomach, which was enormously distended, was partially reduced though its reduction was very difficult as account of the negative pressure in the thorax. The spleen was reduced to its normal position. Sutures of the wound in the diaphragm, which was closed by the fundus of the stomach, was impossible. The patient died about nine hours after the operation.

This was not a true hernia as there was no sac. In traumatic laceration of the diaphragm the peritoneum and the diaphragmatic pleura are generally torn also. During the war many cases of traumatic diaphragmatic hernia were diagnosed by roentgen examination. Unlike congenital diaphragmatic hernia which, for embryological reasons, generally occurs at weak points in the diaphragm, traumatic hernia may occur anywhere. However the latter are more frequent on the left side than on the right side, probably because the liver and its ligaments provide natural support and protection for the right side of the diaphragm.

ALBERT GORE MORGAN, M.D.

# SURGERY OF THE CHEST

Charbonnel and Darmaillacq **Intercoastal Hernia of the Large Intestine of Spontaneous Origin** (Hernie intercostale du gros intestin d'origine spontanée) *Bordeaux chir*, 1934, No 3, P 164

By the term "intercoastal hernia" the authors mean the passage of a portion of the contents of the abdominal cavity through an opening in the diaphragm and intercoastal muscles. As a rule hernia of this type appear a variable length of time after a direct injury of the thoracic wall. They usually occur in the anterior region of the last intercoastal spaces on the left side, the liver theoretically preventing such herniation on the right side. For the development of an intercoastal hernia after trauma it is necessary for the diaphragm and intercoastal spaces to be injured at the same time. Rise and Alquier suggested that the pleural cul de-sac, frequently obliterated by adhesions from pleurisy, may play an important rôle in the formation of intercoastal hernia.

The intercoastal hernia is manifested clinically by a soft, reducible tumor which transmits an impulse when the subject coughs. It is usually well borne, but in some cases the patient complains of vague dull pain and digestive symptoms.

The omentum is incarcerated most frequently and the left part of the colon next most frequently. Much less common is incarceration of the small intestine. Incarceration of the stomach is rare.

The authors report a case in which there was no history of injury and the hernia was on the right side. They attribute the herniation in this case to pleurisy. They state that for the development of an intercoastal hernia on the right side two factors are necessary: (1) a lowering of the liver which leaves a space between the convex surface of that organ and the cupola of the diaphragm, and (2) histological degeneration of the diaphragm.

From the case they report they draw the following conclusions:

1. The apparently spontaneous appearance of a tumefaction on the right thoracic wall in the absence of a history of trauma does not necessarily rule out the diagnosis of intercoastal hernia.

2. The diagnosis is facilitated by roentgenological study of the intestinal tract with the aid of an opaque medium.
3. The treatment of intercoastal hernia is surgical.

AARON S. SCHWARTZMAN, M.D.

Harrington, S. W. **Surgical Treatment in Fourteen Cases of Mediastinal or Intrathoracic Perineural Fibroblastoma** *J Thoracic Surg*, 1934, 3: 590

The clinical symptoms, surgical treatment, histological findings, and operative results in fourteen cases of mediastinal and intrathoracic perineural fibroblastoma are summarized and four cases are reported in detail. The most important factors in the surgical treatment are early recognition of the tumor and its immediate surgical removal even if it causes few symptoms. The most important indication for surgical intervention is the possibility of malignant change. Even when these tumors remain benign, grave complications may result from pressure on the surrounding structures, particularly the spinal cord, trachea, œsophagus, and lungs.

The technique of operative removal of these growths depends upon the indications in the particular case. The posterior approach is used whenever possible and in all cases in which the growth is in the posterior mediastinum. When the tumor is in the lateral wall the incision is made directly over the growth. The tumor should be removed in one stage. The attempt should always be made to perform the operation by the extrapleural route, but in most of the cases reviewed, a transpleural operation was necessary because of adhesions and the site of the growth. The surgical risk is greatly increased by cardiac lesions. In the cases reviewed there were two operative deaths, each of which occurred in a case with associated cardiac disease. The one patient in the series who had a malignant tumor died from recurrence two and a half years after operation. The eleven patients who had a benign tumor are still completely relieved of their symptoms and free from evidence of recurrence, from one to seven and a half years after the operation.

# SURGERY OF THE ABDOMEN

## ABDOMINAL WALL AND PERITONEUM

Schaefer W. Lat. Results of Radical Operation for Inguinal Hernia in the Male (Späteregebnisse nach Radikaloperation des männlichen Leistenbruchs). *Deutsche Zeitschrift für Chirurgie* 1934, 243, 98.

Through the after care service of the Basel Clinic it was possible to trace and collect statistics regarding 73 per cent of all patients who had been operated upon for hernia during the years from 1910 to 1930. Altogether 938 patients were re-examined, of whom 87 had had an operation for recurrence and 84 a primary operation for hernia. Of the latter, 55 re-operated upon for direct hernia and 356 for an indirect hernia. There were 83 congenital hernias, 16 of which are incarcerated, and 8 strangulated hernias 7 of which are recurrent. In addition to the operations for hernia, 23 appendectomies, 4 operations for orchiocoele, 23 operations for spermatocele, and 23 operations for adenoecod testicle were performed. Of the 841 cases in which primary operation for hernia as done (1,000 of which the operation was unilateral and 91 of which it was bilateral) recurrence developed in 56 (3 per cent) and of the 87 cases in which operation was performed for recurrence of hernia, another recurrence developed in 1 (3.6 per cent). The incidence of recurrence as the same after unilateral and bilateral operations, advocating that the danger of recurrence is not increased by operating on both sides. In the 8 cases of incarcerated hernia, including 7 of recurrent hernia, the incidence of recurrence as 3.6 per cent. This percentage approximated that in cases of uncomplicated hernia because incarceration is most apt to occur in hernia with narrow aperture which are anatomically favorable types of hernia and because, in the Basel Clinic, strangulated hernia re-operated upon only by experienced surgeons. Of the 83 congenital hernias, 5 are incarcerated. The absence of recurrence in these cases is attributed to the fact that the patients are children and young men, in all of whom the fascia are still developed. Recurrences occurred in 6 per cent of the 55 cases of direct hernia and in only 3 per cent of the 356 cases of indirect hernia.

In the Basel Clinic the Bassini and Girard operative methods are used. Other more or less recognized methods are employed too seldom to permit their statistical evaluation. Of 13 cases in which the Bassini operation as done, recurrence developed in 4 (3 per cent). Hernia of 8 cases in which the Girard operation as done recurrence developed in only 1 per cent. This shows that the Girard operation is far superior to the Bassini operation. Healing occurred by secondary intention in 3 cases 5 per cent of the

total number. Of 43 cases with deep aseptic fascial suppurations, recurrence developed in only 1 per cent. This figure disproves the widely accepted theory that suppurations result in a high rate of recurrence. In 20 cases of scrotal hematomas the incidence of recurrence was 20 per cent. Of 37 patients with bronchitis or bronchopneumonia, 26 (1 per cent) developed recurrence. In the cases of postoperative pulmonary infarction and infarction-pneumonia recurrence was prevented by the firm scar formed as a result of the prolonged bed rest. The duration of the bed rest averaged eight and three tenths days. The patients with recurrence were out of bed after an average of seven and four tenths day. The author recommends eight days of bed rest for the average patient operated upon for hernia and from ten to fourteen days of bed rest for patients with poor fascia. He states that work should not be resumed until from four to 6 weeks after the operation. In the reviewed cases in which operation was successful only 30 per cent of the patients were constitutionally inferior whereas in the cases with recurrence 2-thirds of the patients are constitutionally inferior. The danger of recurrence increases with age.

Among the late complications in the cases reviewed was atrophy of the testicle which occurred in 21 cases. In 6 cases it was attributed to a scrotal hematoma in 1 case, to division of the spermatic cord. In 6 cases, 1 injury of the spermatic artery. In 1 case to the Schuchman operation. In 6 cases, to an operation for congenital hernia and in 1 case to a simultaneous operation for hydrocoele with strangulation of the spermatic artery. Ten of the patients with testicular atrophy were operated upon by the Bassini method and 4 by the method of Girard. Postoperative elevation of the testicle occurred in 20 cases in which the Bassini operation was performed and in 1 case each in which the Nachburch and Girard operations were done. Inguinal neuralgia developed in 8 cases. 1.6 it followed the Bassini operation, and in the Girard operation. There are no disturbances of sexual function.

Of 78 patients operated upon for a first recurrence, 1 (1 per cent) had another recurrence of 6 operated upon for recurrences, 1 (6.6 per cent) had a third recurrence and of 3 operated upon for 3 recurrences, (33.3 per cent) had fourth recurrence. Among the factors favoring recurrence are the type of the hernia, the patient's constitution and age, and the technique of the operation. In the reviewed cases of recurrence particularly high incidence of constitutional inferiority was found. The average age of the patients as forty-four years, whereas the average age of those subjected to primary operation for hernia about 41 years. In the cases of

second recurrence the average age was fifty years. The chief causes of recurrence are changes in the anatomy of the inguinal region produced by the first operation, a lack of strong normal fascia, and poor circulation. Of the 87 recurrent hernia reviewed 20 were direct and 67 indirect. Of the former, 25 per cent recurred, while of the latter, only 10 per cent recurred. Of 46 cases in which the Bassini operation was done, recurrence developed in 7 (15 per cent), and of 35 cases in which the Girard operation was done, recurrence developed in 2 (5.7 per cent). Of 4 cases in which the Hackenbruch operation was performed, recurrence developed in 1 (25 per cent), and of 2 cases in which the Gelpke-Penz operation was done, recurrence developed in 2 (100 per cent).

Failures may be divided into 2 groups according to their causes. The causes in the first group are the patient's age and constitution, the type and size of the hernia, and the anatomical condition of the groin. These factors play an important part in recurrence. In the second group the causes are errors in the determination of the indications, the pre-operative preparation, the operative technique, the choice of method, and the after-treatment. Failures are always due to one or more of these factors. The author discusses the individual factors of both groups. He agrees with Noetzel that operation for inguinal hernia should not be attempted by inexperienced surgeons, and that before any endogenous or exogenous factor is blamed for failure the responsibility of the surgeon for the unsatisfactory result should be ascertained. Of great aid to successful operation is the Henschen inter-inguinal incision which gives access to both sides. Except in children, all hernia may be operated upon under local anesthesia. Hemostasis must be very exact. There is a greater tendency toward hematoma formation after the Bassini operation than after the Girard operation. In the author's opinion, the suture material is of secondary importance. The knots should be very firmly tied. The hernial sac should be removed high up and the stump should always be transplanted. Lipomata of the spermatic cord should always be removed. The nerves of the inguinal region should be spared as much as possible.

Of the 68 recurrences reviewed by the author, 18 (26.4 per cent) appeared after three months, 13 (19.1 per cent), between the third and sixth months, 7 (10.2 per cent), between the sixth and twelfth months, 10 (14.7 per cent), between the first and second years, 5 (7.3 per cent) between the second and fourth years, and 15 (22 per cent) after four years. All of those which developed three months after the operation occurred in manual laborers who resumed their work too soon.

In discussing the choice of operation, the author recommends the Girard and Bassini methods. He recommends the Girard operation especially because in about 700 cases in which it was performed the incidence of recurrence was only 1.1 per cent and because it is followed by other unfavorable sequelae less frequently than the Bassini operation. In

suturing, whenever possible, fascia should be approximated only to fascia. In the cases of patients with large hernia and those of older patients, semi-castration is advisable.

In conclusion the author states that, instead of adding new operations to the 40 already known, efforts should be made to improve the technique and eliminate the sources of error and danger in the old and tried methods.

(SCHWEIZER) LEO M. ZIMMERMAN, M.D.

Mentzer, S. H. Bile Peritonitis. *Arch. Surg.*, 1934, 29: 227.

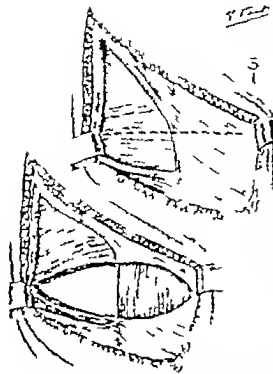
The conflicting clinical and experimental findings regarding the effect of bile peritonitis are reviewed. Mentzer emphasizes that clinically, sterile bile is evacuated from the gall bladder into the peritoneal cavity only after trauma. In a review of twenty-four cases of perforated gall bladder he found that infected bile spread in the peritoneal cavity in eight cases. In the remaining sixteen cases only pus exuded. The end-results in this group of cases show that infected bile which spreads diffusely over the peritoneal cavity causes death unless it is promptly drained by surgical measures. Death is the result of pyogenic rather than chemical peritonitis. Diffuse sterile bile peritonitis is rarely, if ever, fatal. If the bile is not evacuated it produces ascites which may be drained. Mentzer concludes that bile peritonitis produced experimentally in animals is not comparable to bile peritonitis in man.

ROBERT ZOLLINGER, M.D.

Costantini, H., and Marill, R. The Advantages of a Large Muscle-Splitting Incision in Surgery of the Flank. (Sur les avantages de la dissociation musculaire élargie dans la chirurgie des flancs). *Revue de chir.*, Par., 1934, 53: 497.

For six years the authors have been using routinely for operations in the flank an enlarged muscle-splitting incision, a modification of the incision of McBurney. In discussing it they enumerate the incisions usually employed to expose the lower part of the abdomen and give a brief review of a few of them (the longitudinal incisions of Jalaguier and Schueller and the oblique incisions of Lecene, Kocher, Sheede, Kuster, Koeng, de Guion, Plan, and Bazy). All of these incisions are unsatisfactory as they give too little exposure or divide important nerves, blood vessels, and muscles.

The incision used by the authors is started at the lowest point of the ninth or tenth costal cartilage and curved smoothly downward and inward to reach the midline two thirds of the distance between the umbilicus and the symphysis pubis. It goes through the skin and subcutaneous tissue. The fibers of the external oblique muscle are then separated. The separation is begun at the upper angle of the incision and continued down to the fusion of the aponeurosis of the external oblique muscle with that of the internal oblique and transversalis muscles. The lower leaf is then retracted downward and out-



Above. Third step. Florastral separation of the internal oblique and transverse muscles prolonged by section, also transverse, of the anterior sheath of the rectus muscle. This incision is made typically at equal distance from the pubes and umbilicus, but if necessary may be made higher or lower according to the lesion. Below. Fourth step. Exposure of the peritoneum which is about to be incised.

ward to expose the internal oblique. The internal oblique and transversus muscles are separated in line with their fibers (i.e. in transverse direction across the abdomen) the separation being begun near the anterosuperior spine of the ilium (typically half way between the iliacus and symphysis pubis) and continued till the psoas major is reached. The latter structure, together with the anterior sheath of the rectus muscle is then divided transversely as continuation of this part of the incision. The peritoneum is divided in line with the transverse portion of the incision. The rectus muscle is retracted medially while either the upper edge of the incision is retracted upward or the lower edge is retracted downward, depending on the exposure desired. Closure is effected on anatomical lines by layers, with or without drainage.

The authors claim that this method avoids division of important blood vessels, nerves, and muscles gives excellent exposure to the pelvis and flank, and permits easy closure without the likeli-

hood of hernia formation. They have found it is desirable that they are using it for more and more conditions each year. The steps of the procedure are shown in illustrations. MAX M. ZWISLOCK, M.D.

### GASTRO-INTESTINAL TRACT

Eschewy R.: A Contribution on the Clinical Aspects of Tuberculosis of the Stomach (Ein Beitrag zur Klinik der Magentuberkulose) *Arch f. Klin. Chir.* 1934, 79, 190.

Tuberculosis of the stomach is an infrequent disease which is manifested by ulcer and hypertrophy and atrophy of the gastric mucosa. Primary tuberculosis of the stomach occurs only by inoculation by bacteria which are swallowed with the food and become lodged in the stomach. Secondary tuberculosis of the stomach may be caused by inoculation by swallowed or regurgitated bacilli, bacillary emboli reaching the stomach by the hematogenous or lymphogenous route, and spread of the disease to the stomach by continuity or contiguity. The ulcerous form is the most common.

The author reports a case diagnosed as carcinoma of the pylorus which he cured by operation. A mobile prepyloric tumor the size of a child's head, of cartilaginous consistency free from adhesions to adjacent viscera, and macroscopically resembling a carcinoma was found. In the gastrocolic ligament there were several enlarged lymph nodes. After removal of the enlarged lymph nodes wide resection of the tumor was done and followed by end-to-end anastomosis of the duodenal stump.

The correct diagnosis—chronic fibrous and ulcerative tuberculous gastritis—was made only on microscopic examination of the specimen.

The author states that when no tuberculous involvement of the organs can be found preoperative diagnosis is very difficult if not impossible. Tubercle bacilli can be demonstrated in the gastric contents only very rarely. Even chemical analysis yields no indication of tuberculous changes.

The best treatment for cure is radical resection performed as early as possible.

(Book) MARTIN J. ELLERT, M.D.

Schnitzler E.: A Study on the Cause of Death in High Intestinal Obstruction. Observations on Chloroform, Urea, and Water. *Acta Chir. Scand.* 1934, 71, Supp. 21.

The author first gives a historical survey of the experimental work that has been done on this. The principal factors to which death in high intestinal obstruction has been ascribed are auto-intoxication, infection, shock, dehydration, and chemical changes such as hypochloremia, azotemia, and alkalosis. In discussing these factors the author emphasizes especially dehydration, chemical changes, and the effect of the administration of hypertonic solution.

His next report experiments which he carried out on rats to determine whether death in high intestinal

obstruction is due to loss of chlorine or water or both, and to ascertain the distribution of chlorine in animals suffering from experimental ileus

He found that in rats suffering from high intestinal obstruction a considerable quantity of chlorine is lost into the gastro-intestinal tract with resulting hypochloræmia and a definite decrease in the chlorine concentration of the skin, liver, and kidneys. No changes could be found in the muscles, lungs, or spleen. In the brain, the chlorine concentration was increased.

On the basis of these findings he states that the time of survival does not depend upon the degree of hypochloræmia and that there is no evidence that death is caused by a change in the chlorine concentration of any particular tissue or of the organism as a whole.

When the organism loses chlorine the serum chlorine is maintained at the expense of the tissues. The urine shows a pronounced chloropenia whether hypochloræmia is found or not.

The skin and kidneys lose 30 per cent of their initial chlorine content and the liver about 20 per cent. On an average, the quantity lost from the skin equals one half of the entire loss of the organism. There is some indication that as a result of high obstruction, the skin loses its ability to store chlorine.

The rise in the chlorine content of the brain is not specifically associated with intestinal obstruction alone, and there is no indication that it influences the survival of the animal. In the salt treated animals in which a general increase in chlorine took place the increase in concentration was relatively higher in the brain than in the other organs.

The animals treated parenterally with a 10 per cent solution of sodium chloride lost, per unit, the same quantity of chlorine as the non-treated animals. However, the channels through which the chlorine was lost differed, the treated animals losing far less through gastric secretion and far more through the kidneys than the non-treated animals. The administration of a 10 per cent solution of sodium chloride had a pronounced diuretic effect.

The chief conclusion drawn from the experiments with hypertonic saline solution is that in high intestinal obstruction the covering of the loss of chlorine is of importance in the prolongation of life.

In rats suffering from high intestinal obstruction no relation could be demonstrated between the quantity of fluid lost, the water percentage of the tissues, or the period of survival. Dehydration could not be considered the decisive factor in the causation of death. The administration of hypertonic saline solution did not seem to dehydrate the organism with ileus.

Studies of the urea content of the blood in rats suffering from high intestinal obstruction showed the content to be high. The azotæmia responded to the administration of hypertonic saline solution with a definite decrease. However, as it did not disappear entirely in spite of the chloride intake and as it bore

no relation to the chloride content of the tissues, urine, or blood serum, or to the diuresis, the urea evidently increased to such a degree that it could not be excreted as fast as it was produced.

The loss of weight of an animal which occurred during intestinal obstruction was twice as great as that occurring during fasting, partly because of the greater loss of fluids and partly because of the increase in the metabolism. The loss was greatest in the liver and spleen, where it amounted to from 40 to 60 per cent of the original weight.

Since the administration of hypertonic saline solution increased the diuresis and lowered the azotæmia, its beneficial results are to be attributed to an increased excretion of toxins harmful to the organism. Schnohr concludes that death in high intestinal obstruction is due to toxæmia. HARRY W. FINK, M.D.

**Gioja, E.** Duodenal Fistulae and in Particular a Case of Duodenal Fistula as a Late Sequela of Hepaticocolicotomy and Cholecystectomy for Stones. Duodenorrhaphy with Omentoplasty. Cure (Sulle fistole del duodeno ed in particolare sopra un caso di fistola duodenale conseguita tardivamente ad epaticocolicotomia e colecistectomia per calcoli. Duodenorrafia con omentoplastica. Guarigione). *Arch. ital. di chir.*, 1934, 37, 277.

After a general discussion of the literature on duodenal fistula, Gioja reports a case of such fistula. His patient, a woman aged forty-four years, was subjected to hepaticocolicotomy and cholecystectomy for cholelithiasis. The duodenal fistula developed forty-one days after the operation. As it failed to heal under conservative methods of treatment, Gioja performed a duodenorrhaphy and omentoplasty. Cure resulted.

Gioja classifies the various types of duodenal fistulae, discusses their diagnosis and prognosis, and describes the conservative methods which have proved successful in their treatment.

EUGENE T. LEDDY, M.D.

**Larson, L. M., and Nordland, M.** Malignant Tumors of the Large Intestine. *Ann. Surg.*, 1934, 100, 328.

The authors review 210 cases of malignant tumor of the large intestine. The neoplasms occurred with about equal frequency in males and females. They were most common in the fifth, sixth, and seventh decades of life. The oldest patient was eighty-four years of age and the youngest fourteen.

The growths were located with the greatest frequency at the extremities of the colon. More than half of them were in the rectum, rectosigmoid, or lower sigmoid and theoretically could be visualized through the proctoscope or sigmoidoscope.

In about half of the cases coming to autopsy the malignant lesion was resectable by surgical methods as no extension or metastasis was found. In about a third, metastases were discovered in the liver or regional glands. Metastases were found in practically every organ in the body. No significant



difference as noted in the incidence of metastasis associated with lesions in different sites.

Obstruction occurred in 8 per cent of the cases. The immediate cause of death as most frequently peritonitis or exhaustion, but as associated conditions such as cardiovascular, vascular or pulmonary disease, bony proptosis of the prostate or colonic fistula was a contributory factor lowering the patient's resistance.

Polyposis as present in localized or diffuse form in 16 cases. In 11 of these cases there was evidence indicating that the malignant change took place in previously benign polyposis.

McWhorter G. L. Acute Diverticulitis of the Cecum; Right-Sided Symptoms with Diverticulitis of the Sigmoid. *Surg. Clin. North Am.* 1934, 14, 90.

McWhorter reports four cases of intestinal diverticulitis with symptoms on the right side of the abdomen.

The first was that of a boy nineteen years of age who gave a history of the sudden onset of abdominal pain forty-eight hours before he came to operation. The pain was referred first to the umbilicus and seven hours later to the lower quadrant of the abdomen on the right side. There was no nausea, vomiting, diarrhea or constipation. During the last year the patient had had two previous attacks of a similar nature about six months apart. Physical examination revealed marked tenderness and muscle spasm in the lower right quadrant of the abdomen. Rectal examination was negative. Exploration through muscle splitting incision disclosed, on the outer side of the cecum, an indurated mass the size of lemon, which was covered by Jackson membrane. The appendix, which was free and long, as base of the appendix its surface as covered by a diverticulum completely filled by fecaliths and surrounded by broken down necrotic walls. The lumen of the diverticulum, 5 cm in diameter as almost opposite the ileocecal junction. The indurated edges of the opening of the diverticulum were sutured with linen and catgut, the Jackson membrane was sutured over this area, and the abdomen closed without drains.

The second case was that of a man thirty-four years of age who as under medical treatment for pulmonary tuberculosis. This patient had suffered for three weeks from colicky pains in the right lower quadrant of the abdomen and vomiting after the ingestion of food. Physical examination revealed tenderness and muscle spasm over the lower right side of the abdomen. At exploration through right rectus incision, the gall bladder was found normal. The appendix as long and moderately congested, and contained a fecalith in its lumen. The pericentimeters from the stump invaginated all of the cecum. A hard round mass as found

This proved to be a small diverticulum completely filled by a fecalith 5 cm in diameter. Following removal of the diverticulum the edges of the opening were invaginated with a linen pursestring and an outer catgut suture. The patient made a good recovery.

The third case was that of a man fifty-one years old whose chief complaint was the onset of moderately severe pain in the lower abdomen one week previously and occasional vomiting during the last few days. Examination disclosed marked muscle spasm with rigidity over the entire lower part of the abdomen on the right side. Rectal examination was negative. The findings suggested cecal appendicitis probably complicated by peritonitis. Under conservative treatment for one week the symptoms gradually abated. Later X-ray examination showed multiple diverticula of the sigmoid and descending colon.

The fourth case reported was that of a man sixty-six years of age whose chief complaint was pain in the lower right quadrant of the abdomen and constipation over a period of three weeks. The leukocyte count was 7,800. Examination of the abdomen revealed a large swelling in the right lower quadrant in which gurgling sounds were heard on palpation. The mass extended down under Poupart ligament into the thigh. An incision over the mass on the thigh evacuated a large amount of pus. The tract extended into the iliac fossa. After several days a large amount of feces was discharged through the opening onto the thigh. The wound healed slowly. After about ten weeks it closed completely. A roentgen examination made later revealed invagination of the cecum in the descending and sigmoid portions of the colon. The patient has remained well for three years.

In the discussion of these cases McWhorter says that the frequency of diverticula of the intestinal tract is difficult to determine from routine autopsies. In the large bowel diverticula occur most often in the sigmoid and the descending portion. Diverticula are classified as congenital and acquired, true and false. A true intestinal diverticulum presents all layers of the intestinal wall. The false diverticulum the muscularis is absent. Diverticula of the colon are attributed to increased tension from the lumen of the bowel associated with constipation and muscular spasms, and diverticula occurring in the small intestine along the mesenteric root because of the blood vessels together with traction.

Inflammation and perforation may occur in diverticula as in appendicitis, but in such complications in diverticulum localization is more likely than in similar localization in the appendix and the virulence of the infection is not so great as in the latter. In the acute stage, perforations should be sutured, fecaliths removed, abscesses drained, and the diverticulum removed if feasible. In the chronic condition malignancy may be suggested. If structure is present, resection may be necessary and should be done before cancer formation occurs.

JOHN B. V. KIM, M.D.

# SURGERY OF THE ABDOMEN

Angeli, A. Invagination of a Haustrum of the Cæcum (L'invaginazione haustri cecale) *Arch ital di chir*, 1934, 37 417

Invagination of a haustrum of the cæcum or partial invagination of the walls of the cæcum was first described by Kojovsky in 1925, although it must have been observed by others previously. Seven cases have been recorded in the literature. The author reports a case which he operated upon. The diagnosis has never been made during life. In seven cases a diagnosis of acute appendicitis and in one case a diagnosis of ileocæcal invagination was made. The author gives brief abstracts of the cases reported in the literature. In all of the cases the invagination occurred in the first, second, or third haustrum, counting from the fundus.

There are symptoms which should permit a diagnosis in the first stage of the condition when symptoms of pseudo occlusion predominate over those of inflammation. This period varies in length from weeks to years. The patient complains of intermittent pain in the abdomen, particularly on the right side, frequent nausea and vomiting, transitory fever, and irregularity in evacuation of the bowels. In the author's case the latter consisted of alternate periods of constipation and diarrhoea. The picture in this stage suggests ileocæcal invagination rather than appendicitis. If the condition is suspected at this time the diagnosis can be confirmed by roentgen examination. None of the cases reviewed were diagnosed in this way as none of the patients came for treatment until the second stage of the disease when the signs were those of acute inflammation necessitating an emergency operation. The condition is doubtless caused by increased virulence of the bacterial flora of the involved part of the intestine. As a rule the treatment consists of simple disinvagination of the haustrum and closure of the abdomen. If necessary, appendectomy and cæcopexy may be performed.

Edwards, H. C. Diverticula of the Vermiform Appendix *Brit J Surg*, 1934, 22 88

The reported incidence of diverticula of the appendix ranges from 0.26 to 0.53 per cent. Such diverticula have no distinct clinical characteristics. They are found on routine pathological examination of appendices removed at operation for acute appendicitis. Rarely, as in two cases cited by the author, they can be visualized by X-ray examination.

Edwards' discussion of the pathogenesis of appendiceal diverticula is based on the pathological examination of nine specimens. "There are two types of diverticula: (1) hernial pouches of mucous membrane forced through a gap in the muscle coat, and (2) distended pockets of mucous membrane over which the muscularis will eventually atrophy so that a complete diverticulum, visible from the peritoneal aspect, is formed." In all of the specimens examined the wall of the appendix showed

inflammatory changes. The absence of such changes in the walls of the diverticula leads the author to the conclusion that they are a contributory factor in the formation of diverticula. Chronic inflammation contributes to diverticula formation by causing partial obstruction of the lumen of the appendix and weakness and persistent spasm of the muscular coat. The most common site of diverticula is along the concavity of the appendix, but association with perforating blood vessels is not striking.

In the majority of the specimens examined the muscle coats were thicker than normal. The author believes that this thickening may be due to contraction of the muscle with fixation in contraction, hypertrophy of the muscle, and inflammatory oedema. Most important, Edwards believes, is spasm of the longitudinal muscle throwing the mucous membrane into folds. Spasm of circular muscle obliterates the lumen, bringing mucous membranes in opposition. The opposing surfaces pass into gaps formed by the passage of blood vessels. In this way the author explains obliteration of the lumen of the appendix. Following such obliteration there is increased pressure distal to the obstruction, causing pouching of the mucous membrane which subsequently becomes first a herniation and finally a true diverticulum.

Appendiceal diverticula may therefore be due to passive distention or irregular muscular action. Predisposing causes are the presence of gaps in the muscular coats through which the vessels enter and weakening of the muscular coat as the result of chronic inflammation.

In conclusion Edwards says that it is impossible to diagnose diverticula of the appendix before operation.

T. BANFORD JONES, M.D.

D'Aunoy, R., and Fine, A. Pseudomyxoma Peritonei of Appendiceal Origin *Am J Cancer*, 1934, 22 59

The presence of gelatinous material in the peritoneal cavity was first described in 1884 by Werth. Werth called the condition 'pseudomyxoma peritonei' and attributed it to the rupture of a pseudomucinous cyst of the ovary with resulting implantation of the cyst contents on the peritoneal surfaces. The postmortem findings in a case of pseudomucinous cyst of appendiceal origin were first reported by Fraenkel in 1901. This condition is rare. In a review of the literature the authors were able to find the reports of only ninety authentic cases. The single case found in the records of the Charity Hospital of Louisiana is reported as follows: The patient was a colored woman forty-seven years of age who was operated upon for umbilical hernia. The hernial sac contained omentum and gelatinous material, and the abdominal cavity was completely filled with the gelatinous material. Death occurred forty days later. At autopsy, the abdomen was found to contain free fluid in addition to the jelly-like material. The appendix and cæcal head formed a conglomerate mass consisting of a wall

of fibrous tissue enclosing a cavity containing purulent fluid and a large quantity of gelatinous material. The diaphragm was pushed up by the gelatinous material to the level of the third rib. The gut was partially obstructed for  $\frac{3}{4}$  ft proximal to the ileocecal valve. In this portion it would barely admit the index finger. The pathological diagnosis was pseudomyxoma peritonei of pseudocolic origin.

Pseudomyxoma peritonei is not a disease in itself. It may develop from such conditions as ovarian cystadenomas, intestinal diverticula, mucocoeles of the appendix, and retroperitoneal cystadenomas, and may occur in the course of a recognized malignancy. In the case reported by the authors the appendiceal origin of the growth was proved by the fact that the myxomatous material was present in the cavity and the wall of the appendiceal abscess but nowhere else. The condition was evidently of long standing as symptoms of chronic obstruction were present at the time of the examination. This supports the theory that the growth is comparatively benign and that death is usually due to obstruction of the intestinal tract. The opinion is expressed that the majority of such tumors are cystadenomas.

JOHN W. NEWTON, M.D.

Voelcker F. My Experiences with High Rectal Amputation (Milde Erfahrungen mit der hohen Rectumamputation). 38 T. 4. Deutsch. Ges. f. Chir. Berlin, 1911.

In combating carcinoma of the rectum Voelcker has performed high amputation more and more often, whether the carcinoma was somewhat higher or lower. His aim was gradually to arrive at one form operation with which he and his assistants could become familiar. The advantages offered by standardization of the operation are an exact technique, greater safety and the saving of time. The operation is simple. In the first stage, sigmoid colectomy is done and in the second, the main operation, the lower portion of the rectum including the anus, is removed. The chief disadvantage of the operation is its high primary mortality. In the author's earlier cases it ranged between 3 and 4 per cent, but in his later cases it has been lower. In thirteen cases in which Voelcker performed combined rectum extirpation in the last four years there were two deaths, a mortality of 5 per cent.

The artificial anus established in the first stage is single-barreled and made through an incision on the left side. The operability of the carcinoma having been determined, the effluent loop is closed and dropped back. The main operation is done about eight days later with the patient in high Trendelenburg position. A median incision is followed by liberation of the bowel from above downward, ligation of the vessels in the mesorectum, and blunt dissection of the bowel as far down and as possible

The patient is then turned on his abdomen and the bowel removed from below. He is then turned back and the peritoneum and abdominal wall are closed carefully. In spite of its inconvenience, the three-fold turning of the patient is preferred by the author to two-fold turning because exact suturing of the peritoneum is possible only after the bowel has been completely removed and is absolutely essential. Before the operation the natural anus is closed by perineal suture. By the procedure described the entire bowel is removed as a closed container and its dangerous, infectious contents are prevented from entering the wound. The abdominal wound is closed tightly and the sacral wound is drained. Resection of the sacrum is never necessary. In most, resection of the coccyx is sufficient, while in some even this is unnecessary. Complete hemostasis of the many veins in the sacral wound is very important. Diathermy has become indispensable for this purpose as it is safe and saves time. Ligation of the hypogastric artery which the author performed regularly at first, has been entirely abandoned by him as it is unnecessary.

Of the 10 fatalities in Voelcker's cases, one was caused by pulmonary embolism. The other occurred in a case in which, during the main operation, an abscess was found in the loop of bowel which had been closed during the preliminary stage. The operation was interrupted for fear of spreading the infection, and four weeks later was undertaken as a third stage. At that time the wound was still granulating. It apparently harbored more dangerous organisms than was suspected. The patient died of peritonitis. This failure could have been prevented by better technique at the preliminary operation.

The operating time has been materially reduced. In spite of the three changes of the patient's position, the operation requires scarcely more than one hour and sometimes even less.

With regard to the late results the author says only that some of his patients visit him from time to time and gratefully report their well being. They all feel quite satisfied with the artificial anus.

In three cases, examination of the extirpated bowel segment proved surprising as, above the carcinoma for which the operation was done, it revealed one or more additional carcinomas the existence of which had not been suspected. Schindler has called attention to the importance of such findings.

While his series of cases is not large, Voelcker has gained the impression that if a surgeon and his assistants become familiar with the combined high-rectum extirpation, they will develop standardized operative procedure which, in spite of its magnitude, loses much of its former terror and danger.

(VOELCKER.) LEO M. ZANCANNA, M.D.

# GYNECOLOGY

## UTERUS

Meigs, J V Prolan in the Treatment of Abnormal Uterine Bleeding *New England J Med*, 1934, 211 289

In the author's use of prolan in the treatment of abnormal uterine bleeding from 500 to 1,000 rat units are given over a period of ten days. The treatment is administered during the bleeding or begun ten days before the expected time of menstruation. Local reactions occur only occasionally. The response of the bleeding is occasionally extremely rapid, occurring in one or two days, but sometimes is slow, requiring from ten to twenty days. If one treatment is unsuccessful repeated treatments are given. From six to eight series are given.

In the cases of eleven patients with a normal menstrual history who began to flow continuously there were seven excellent and four poor results.

Of eighteen patients with too frequent menstrual periods, eleven were cured and seven were not benefited.

Of seventeen patients who had a continuous flowing after a period of amenorrhoea corresponding to Shaw's Type 1, only eight were benefited. The failures could not be explained.

In the cases of thirteen patients with regular but prolonged menstrual periods, there were six excellent and seven poor results.

Of the total fifty-nine patients whose cases are reviewed, more than 54 per cent were benefited. The use of prolan was considered preferable to irradiation or surgery especially as nearly all of the patients were between twenty and forty years of age. The incidence of childbearing was low, suggesting that abnormal bleeding of the types described is most common in women with unused sexual organs. In speculating further regarding this observation the author calls attention to the fact that chronic cystic mastitis, cancer of the breast, cancer of the endometrium, and tumors and cancers of the ovary are more frequent in sterile than in fertile women.

Curettage proved to be of no value in the conditions discussed. The good effect of the prolan treatment lasted for from three to eighteen months. Frequently the bleeding recurred after three or four months but responded again to treatment.

A. F. LASH, M D

Phaneuf, L E Radium Therapy in Uterine Haemorrhages of Benign Origin *New England J Med*, 1934, 211 304

Radium employed in suitable doses and in properly selected cases is a valuable agent in the treatment of uterine haemorrhages of benign origin. It

finds its greatest field of usefulness in the treatment of severe haemorrhages occurring near or at the menopause from uteri showing no gross macroscopic lesions, such as those occurring in hypertrophy and hyperplasia of the endometrium and uterine fibrosis.

In the haemorrhages of adolescence radium treatment to avoid hysterectomy requires caution and should be used only after medical, endocrine, and haemostatic treatment have failed. The dose should be very small.

Because of the danger to the products of conception from irradiation, radium should not be used to regulate the menstrual periods or in an attempt to favor pregnancy.

Radium is of value for the treatment of small fibromyomata of the interstitial type, especially those occurring in women nearing the menopause.

It may be used in conjunction with operations for repair of the cervix and for cystocele and rectocele as it does not in any way interfere with healing.

A single application giving an appropriate dose is sufficient to bring on permanent amenorrhoea.

If the patients are properly selected the mortality should be nil.

Successful treatment of uterine haemorrhages of benign origin requires only a small amount of radium (0.050 gm) and minimal apparatus.

ROLAND S. CRON, M D

Smith, F R The Incidence of Vaginal Fistulae in Patients with Carcinoma of the Cervix. *Am J Cancer*, 1934, 22 52

The development of a vaginal fistula in carcinoma of the cervix is primarily a manifestation of advance of the disease. The incidence of vaginal fistulae is twice as high in untreated as in irradiated cases. In cases treated by irradiation the incidence is increased by (1) interstitial irradiation with radon, (2) lack of filtration, (3) repeated treatments, (4) infection, (5) certain structural characteristics of the lesion, and (6) the performance of hysterectomy before the irradiation. Mentioned in order of decreasing frequency, the types of fistulae are (1) the rectovaginal, (2) the vesicovaginal, and (3) the combined rectovaginal and vesicovaginal.

J. THORNWELL WITHERSPOON, M D

## ADNEXAL AND PERIUTERINE CONDITIONS

Kahn, M E, and Norris, S Primary Carcinoma of the Fallopian Tubes *Am J Obst & Gynec*, 1934, 28 393

The authors report four cases of primary carcinoma of the fallopian tubes. Two of the patients were only eighteen years old. The authors state that while the importance of inflammation as an etiologic

local factor is disputed, three of their four patients showed evidence of chronic inflammation. A clinical diagnosis is extremely difficult. Hope for increasing the frequency of diagnosis lies in keeping the possibility of the condition in mind.

At operation, the lesion often stimulates chronic tubal inflammation or tuberculous. Opening of all tubes and their inspection for papillary growths is the operating table, as advised by Gupta, would aid in the diagnosis and the institution of the proper surgical treatment.

In the cases of women more than forty years of age a negative curettage with history of irregular bleeding or brownish or bloody discharge is suggestive of tubal carcinoma. In such cases the uterus should be carefully palpated for enlargements.

LOWARD L. CORWELL, M.D.

Montgomery J. B., and Farrell J. T. J. The Results of Postoperative X-Ray Therapy in Carcinoma of the Ovary. A Series of Twenty-Two Cases. *Radiology* 93: 3-57.

The diagnosis of the twenty-two cases reviewed by the authors was proved by histological examination of removed tissue. The diagnosis was adenocarcinoma in four, papillary adenocarcinoma in three, papillary cystadenocarcinoma in fourteen, and granulosa cell carcinoma in one. The cases were divided into three histological grades based upon the degree of anaplasia as indicated by the extent of cell differentiation, variations in cell size and shape, and nuclear changes. Clinically the cases were classified by Schmitz' method of classifying carcinoma of the cervix.

Röntgen treatment was started from ten to four weeks after operation. Prior to August, 1937, maximum doses were given in a single sitting at right angles to one of three or four pelvic ports. The factors of each treatment were 1500 r from 170 to 200 kV filtration with 0.5 mm of copper and 1 mm of aluminum, skin-target distance of 50 cm, and ports of 6 or 10 sq cm. The dosage as the quantity the skin would tolerate given in from three to four days. With the use of the factors cited the erythema dose was 7000-8000 r. After August, 1937, the saturation method of Mahler was employed (in the use of three or four ports). Depth-dose graphs are used and the dosage as measured by roentgens. The period from January, 1937, to August, 1939, the erythema dose was 9700 r. Since August, 1939, it has been 8000 r. In all cases an effort was made to give the maximum irradiation such the tissues would tolerate, using four pelvic ports. The treatment as given on alternate days, and an attempt was made to deliver a depth dose of from 5000 to 8000 r in four weeks. In three cases radium was used. Myeloblastosis was uncommon, but did not become serious and was not considered an indication for stopping the treatment.

Ten of the patients whose cases are reviewed had malignancy of Grade I, low grade of malignancy. Of these seven are alive, and one

cannot be traced. The average length of survival to date of those still alive has been thirty-eight months, while the average length of survival of those who died was six and a half months. Of the five patients with malignancy of Grade 2 (intermediate grade) all are dead. Of the seven patients with malignancy of Grade 3 (high grade) six are dead and one is still alive after more than six years. The prognosis varied with the grade of malignancy and the operability of the tumor.

The most frequently encountered tumor was the papillary cystadenocarcinoma. Of fourteen patients with a neoplasm of this type, four are still alive after more than five years. The only other patient still alive after five years had granulosa cell carcinoma with malignancy of Grade 1.

The authors conclude that irradiation frequently resulted in palliation of the symptoms and prolongation of life.

EARL E. BURKE, M.D.

## MISCELLANEOUS

Serdinokoff M. G., and Lavitskaya, M. K.: Blood Transfusion in Certain Gynecological Conditions (La transfusion sanguine dans certaines affections gynécologiques). *Gynec. et Obst.* 93: 30-37.

This article is the report of a study instituted by the Scientific Institute of Moscow for the Protection of Maternity and Infancy. It had been noted that blood transfusion, while frequently carried out in general surgery, as rarely resorted to in gynecological practice. The authors purpose was to determine the indications and contra-indications of transfusion in certain gynecological affections. They investigated (1) the comparative advantages of direct and indirect transfusion methods, (2) the fate of the transfused blood, and (3) the mechanism of the effect of transfusion upon the recipient.

In Russia there appears to be a distinct preference for the indirect method of transfusion, chiefly because the direct method is technically more difficult, but also because suitable donors are not always readily available. According to the findings of the Institute of Blood Transfusion, citrated blood may be preserved for as long as twenty-to thirty days. The criticism that preserved blood may harbor infection is answered by the statement that bacteria, if present, are usually attenuated and do not offer a serious menace. According to the authors, there is little evidence of biological difference between whole and citrated blood.

The fate of transfused blood is the subject of controversy. In general it is believed that the length of survival of the erythrocytes depends entirely upon the hemolytic index of the recipient.

The mechanism of action of transfused blood is complex. Besides restoring the intravascular pressure, the transfused blood has a nutritive effect activating the neuromuscular apparatus of the heart. It reduces hormonal deficiency by increasing the oxidation processes, and, by means of its salts and albumens, excites the hematopoietic functions, stimu-

## GYNECOLOGY

living especially the bone marrow. It aids in overcoming infection, neutralizes toxins and augments the power of coagulation.

Death resulting from a transfusion has been attributed to faulty technique and to chemical changes due to disease changes, the use of unclean apparatus, incompatibility between the donor and recipient.

The author lists the following indications for blood transfusion in gynecology: (1) acute and chronic transfusion in hemorrhages due to abnormal uterine function, uterine adenomyosis or ectopic pregnancy; (2) acute and chronic purulent infection of the uterus, salpingitis; (3) delayed bleeding; (4) acute and chronic purulent infection of the uterus, salpingitis; (5) ectopic pregnancy; (6) abdominal and pelvic cancer; (7) pre-operative preparation of patient for vitality; and (8) post-operative management to restore vitality.

Transfusion increases the vitality of the organism and permits extensive surgical intervention with a lower mortality. In many instances it prevents postoperative complications and surgical shock and hastens convalescence. In cases of carcinoma it often improves the patient's condition sufficiently to permit radical surgical treatment and effectively inhibits cachexia and anorexia. In general it so improves the resistance of the organism against infection that it merits more frequent use in gynecological practice.

HERBERT MACLEOD, M.D.

**Marion, G. The Formation of a Continent Urethra in Woman and the Use of This Operation in Extrophy of the Bladder.** He is constitutionally defective, continent, hysterectomized, and has a cystostomy. *J. Surg. and Gynecol.* 1934, 17, 63.

About ten years ago the author repaired a urinary bladder the boy was all of a sudden badly torn during labor that the opening allowed complete

herniation of the posterior wall of the bladder. After closing the tear he reconstructed the urethra by placing a tubular graft from the vagina in a tunnel like opening formed between the bladder and the vulva with a long trocar. The result of this operation was so excellent that continence and urination were practically normal. Marion has now performed the operation twelve times.

Reconstruction of the urethra can be accomplished also by making a simple tunnel like opening and introducing a sound into it. After a time the canal becomes covered with epithelium. The results seem to be the same as when a tubular graft is placed in a tunnel made with or without a graft.

The new urethra formed with or without a graft must be watched for a long time. The patient should be instructed to pass a bougie at first daily and then slightly every three or four weeks.

The urethra formed by the procedures described is patent and continent but the continence is pathological being due to the formation of fibrous tissue around the new canal.

The author mentions also a case in which he formed a urethra five years ago. After the operation urination and urinary continence were entirely normal. Recently the patient developed a cystitis which is found to be due to a stone in the bladder. The author was able to perform a cystoscopic examination and to crush the stone with a lithotrite through the new canal.

Marion has used the described method also in the treatment of extrophy of the bladder. He describes and shows by illustrations his operative technique in a case of extrophy of the bladder in a little girl and mentions the few differences in the operation performed for extrophy of the bladder in males.

LESLIE A. DICKSTEIN, M.D.

# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

Brooks, R., Roberts, R. E., Bristow W. R., Vaughan, K., and Others: Discussion on the Physiology and Pathology of the Pelvic Joints in Relation to Childbearing. *Proc Roy Soc Med Lond* 934, 27 2

BROOKS stated that the sacro-iliac joint of the female, unlike that of the male, undergoes a rapid increase in mobility from puberty to the age of twenty five years. Pregnancy increases its mobility further. The range of movement at full term being increased two and a half times. After parturition the joint slowly returns to normal in about three months. There appears to be some relation between the involuntary changes in the uterus and those in the ligaments of the sacro-iliac joint, delay in return to normal in one frequently coinciding with similar delay in the other. Brooks advocates exercises in the prone position for young females to conserve the movement of the sacro-iliac joints for the child-bearing period.

ROBERTS reported measurements of the pelvic joints of pregnant and non-pregnant women by X ray examination. These showed that the symphysis pubis definitely increases in width during pregnancy—more in multiparae than in primiparae—and returns to normal some time after parturition. No further predictable widening was noted during parturition. The sacro-iliac joint shows slight increase in width during pregnancy and after parturition returns almost to normal. These changes in the symphysis pubis and the sacro-iliac joints permit normal movement of the sacro-iliac joint.

BRISTOW stated that malposture and particularly the lordosis which occurs in pregnancy are responsible for much of the back pain during and after pregnancy. In this exaggerated lordosis the sacrum becomes more horizontal and the lumbosacral joint turns upon the joint. In the antenatal care the patient should be given instructions for correction of the exaggerated lordosis and should be fitted with special corset. Bristow advocates the Goldthwait brace. He stated that, after delivery, postural training should be begun as soon as possible. Mobilizing the joints fully and produces the full extension of the hip joint which is necessary for correction of the tilt of the pelvis, forcible manipulation under anaesthesia may be required. Arthrodesis of the sacro-iliac joint should be the last resort.

VAUGHAN called attention to the increase in the distance between the ischial tuberosities and the widening of the subpubic angle produced by the squatting position. She stated that she had delivered several women in this position.

ROY discussed the change in the size of the transverse measurement of the pelvic outlet in various positions and demonstrated that when the patient lies on her side with the thighs flexed and adducted the diameter of the outlet is considerably increased.

HENRY S. ACKER, JR., M.D.

Giacchi, N. Active Expansion of the Uterus According to Stamen and Its Importance in the Physiology of Pregnancy (L'expansion active de l'utérus, selon Stamen, et sa valeur dans la physiologie de la grossesse). *Rev franç de gynéc et d'obst* 934, 29 657

The active expansion of the pregnant uterus demonstrated by Stamen constitutes the basis of new theories regarding the physiology of pregnancy.

The author, pupil of Stamen, reviews his pre-tonicokinetic activity of the uterus. Two cycles are described, that of the non-pregnant and that of the pregnant woman. Each cycle has four phases. In the non-pregnant state that first phase is from the maturation of follicles to ovulation (five or six days), the second, from ovulation to corpus luteum formation (two or three days), the third, the pre-menstrual period from corpus luteum formation to the beginning of menstruation (from ten to twelve days), and the fourth, the period of menstruation and postmenstrual reconstruction (approximately ten days). In pregnancy the first two phases are identical with the first two in the non-pregnant state as fecundation occurs after ovulation. The third phase is the pregnancy phase with duration of approximately two hundred and eighty days, and the fourth phase is the postpartum phase with duration of approximately forty days. During these phases Stamen found tonicokinetic muscular activity due to hormonal influences acting through, or in close harmony with the nervous mechanism. The first and third phases are characterized by vascular congestion, and the second and fourth by vasoconstriction. These phenomena are not confined to the vascular system, but are participated in by all muscle fibers of the organism.

Other investigators also have distinguished two different attitudes of the uterine muscle, namely an active or contraction phase, and a passive or relaxation phase. Stamen claims that even the relaxation phenomenon depending on the vagus is an active way as the contraction depends on the sympathetic. He distinguishes four attitudes: (1) decontraction, (2) retraction, and (3) contraction. These may be reduced to two: (1) systole (contraction and retraction) and (2) diastole (decontraction and distraction). These phases are

ceed each other, with predominance of one or the other according to the phase of utero-ovarian function. Diastole predominates in the first and third phases, and systole in the second and fourth. These observations led to the formulation of the law of predominance and the law of periodicity.

In pregnancy Sfameni distinguishes two periodicities: (1) primary periodicity, in which, during the first six months, diastole predominates and during the last three months it diminishes until systolic predominance leads to delivery, (2) secondary periodicity, which consists, in addition to the activity of pregnancy, of the phenomena of the menstrual cycle explained by the fact that the endocrine activity of the ovary is maintained during pregnancy not only by persistence of the corpus luteum but also by periodic maturation without rupture, of many follicles. Clinical proofs of this periodicity are seen in the growth of the pregnant uterus, menstrual crises during pregnancy, abortion coincident with the onset of periodic menstrual bleeding, and the occurrence in pregnant women of blood losses at the usual times of menstruation.

The intensity of predominance is influenced by multiparity and age, a favorable action being noted up to the fifth pregnancy and the thirty-fifth year. Constitutional factors are also of importance. Sfameni distinguishes three constitutional types: (1) the normogenital (menarche at the thirteenth or fourteenth year, menstruation occurring at twenty-eight-day intervals, with a duration of four or five days and a blood loss of from 100 to 200 gm), (2) the hypergenital (menarche at the eleventh year, menstruation occurring at twenty-day intervals, with a duration of seven or eight days and a blood loss of 500 gm), and (3) the hypogenital (menarche at the fifteenth year, menstruation at thirty-day intervals, with a duration of only several hours and a minimal blood loss).

According to Sfameni, menstruation is an epiphenomenon due to degeneration of the corpus luteum resulting from the lack of decidual, placental, and myometrial hormones and changing the premenstrual endometrium into the menstrual type. The regression of corpus luteum activity gradually determines diminution of the diastolic predominance and accession of the systolic phase during menstruation or delivery. The change from the diastolic to the systolic tonus and vice versa suggests the existence of two antagonistic hormones.

Giacchè attempts to prove that active expansion is a property of the uterine musculature just as it is the property of the muscles of the heart, lungs, blood vessels, and intestines, and that therefore expansion of the uterus during pregnancy is not purely a passive phenomenon responding to the pressure of the developing ovum. In support of this contention he cites the fact that during the first months of ectopic pregnancy the uterus develops at approximately the same rate as in intra-uterine pregnancy. Sfameni claims that the increase in the volume of the uterus and the size of its cavity is not due solely to muscular

hypertrophy or vascular congestion, as others have taught, but is a result of motor activity of the uterine musculature influenced by hormonal changes during pregnancy and menstruation. He points out that this enlargement in the first months of pregnancy is asymmetrical, involving the upper more than the lower segments, and at all times is greater than that which would be produced merely by ovular pressure. During the last trimester of pregnancy the lower segment increases more than the upper. This reversal is attributed by Sfameni to a predominant attitude of diastole in the upper segment and of systole in the lower segment, the process being reversed at the end of gestation as a result of neurosympathetic changes. This active expansion, according to Sfameni, creates a negative pressure or vacuum within the uterine cavity.

The negative pressure is said to affect the site of fetal development and to play a part in the formation of amniotic fluid. In the latter, two factors are concerned: (1) a mechanical factor, the active expansion of the uterus which occurs in three distinct ways, namely, by the force of aspiration, by distention and flattening of the amniotic epithelial cells with a change in their permeability, and by excitation of the amniotic epithelial cells due to the aspiration, and (2) a biological factor, the stimulating action of the hormones which changes the permeability of the amniotic cells.

According to Sfameni, placentogenesis is also directly concerned in the process of active expansion. The formation of the fetal membranes from the chorion laeve and the decidua reflexa and of the placenta from the chorion frondosum and the decidua serotina is the result of: (1) active expansion of the uterus, (2) intra-ovular pressure, and (3) intralacunar pressure. The combined action of the first two results in the flat shape of the placenta, while the pressure of blood within the lacunæ determines the growth in the area of the organ. Alterations of these factors result in marginal insertion of the placenta, due partially to deficiency of intra-ovular pressure and active uterine expansion, and to other placental anomalies such as succenturiate lobe, velamentous placenta, and reniform placenta.

Other phenomena of the physiology of pregnancy, aside from these involving the uterus, are attributed to tonicokinetic alterations of muscular tissues throughout the organism. Reductions of capillary pressure are factors in the production of œdema. A diastolic predominance of the biliary channels is claimed to cause bilirubinæmia during early pregnancy. Varicose veins are attributed to the diastolic status of the venous musculature. Constipation is said to result from expansion of the gastro-intestinal muscles from hormonal action. Giacchè attributes all of the maladies of pregnancy commonly classed as toxæmias to hormonal imbalance. He states that it is the exuberance of ovarian hormones which brings about the disequilibrium of the sympathetic system, just as their presence in normal quantities determines proper function. HAROLD C. MACE, M.D.



## LABOR AND ITS COMPLICATIONS

Cathala, V., and Seydel, R.: A Note on the Pathological Anatomy and Pathogenesis of Oedema of the Cervix Uteri During Labor (Note sur l'anatomie pathologique et la pathogénie de l'œdème du col de l'utérus au cours du travail) *Gynec et obst* 1934, 30: 1.

The authors observed the occurrence of cervical oedema during labor in 95 of 43,603 deliveries at the Hospital Saint Louis during the past ten years. It therefore occurred in 1 of every 458 deliveries. The authors believe that its incidence is in reality much higher as when it does not cause dystocia it is probably not recognized.

Two types of oedema are described: (1) the soft or simple and (2) the hard with rigidity. The former which is the more frequent, usually involves the anterior cervical lip and rarely the entire intravaginal portion of the cervix. Sometimes it is limited to the median portion of the anterior lip though usually it extends to one or the other side. The cervix is thick, doughy or resistant to the touch, forming a large swelling beneath the pubes. On inspection, this portion is seen to be increased in size, jutting out ahead of the fetal head as shiny and more or less deep red object. Occasionally the posterior lip is equally involved, but as a rule it is of normal size and consistency.

Hard oedema is generally less extensive, involving as a rule only a portion of the cervix. It is firm to the touch and its consistency resembles that of greasy leather. On inspection it has the appearance of a thick, viscidous, almost black circle surrounding the fetal head. Its color is deeper than that of soft oedema, and the superficial portions are often necrotic.

The authors have examined cases of soft oedema and 3 of the hard variety. Histological examination shows dislocation of the connective tissue fibers by fluid in the interstitial substance. Leucocytes are present. Biopsies of the anterior and posterior lips in one case showed little difference except for absence of serous infiltration in the latter. In the case of hard oedema the rigidity is more marked difference as noted. The roots of oedema were less luminous and the connective tissue meshwork appeared to be compressed by intense vascular congestion with areas of diapedesis of erythrocytes and leucocytes into the tissue spaces.

These 2 types of oedema represent extremes but between such many intermediate types can be recognized both clinically and histologically. They differ only in the degree of development of the serous infiltration or hemorrhage.

Many theories have been advanced to explain the pathogenesis of the condition on the basis of infection or uterine inertia. The authors reject them as either vague or insufficient. They believe that cervical oedema is due entirely to compression of the cervix between the fetal head and the pelvis. In their cases there were difficulties in engagement due to pelvic

contraction, abnormal position of the fetus, or disproportion. They found contracted pelvis or a transverse position of the head in 65 large fetuses in 1 a face presentation in 3 brow presentation in 2, and breech and shoulder presentation in one each. In 1 case the cause of the oedema was not ascertained.

The authors state that cervical dystocia is associated most frequently with transverse position of the fetal skull, this being due usually to difficulties of engagement in a flat pelvis. With few exceptions, the cause of cervical oedema is mild pelvic contraction or disproportion. The oedema results from obstruction of the blood and lymph. It seldom occurs while the bag of waters is intact or the fetal skull rests above the superior strait. Compression of the cervix results only after the head enters the narrow pelvis. In the flat pelvis the anterior lip is compressed most often because the deflexed skull, lying in the transverse diameter of the inlet, presses upon the anterior arc of the pelvis. When the compression is prolonged the oedema is usually of the hard variety which may lead to necrosis and detachment of the anterior lip. In generally contracted pelvis equal compression of the entire cervix leads to oedema of both lips and possibly to amputation of the entire intravaginal portion of the cervix.

H. WOOD C. STACE, M.D.

Ginglinger, A., and Tancowitz, S.: A Study Based on Twenty-Four Years of Conservative Low Caesarean Section (Étude sur vingt-quatre années de césarienne basse conservatrice) *Gynec et obst* 1934, 30: 5.

During the twenty-four year period from 1908 to 1932 there was a gradual substitution of the low caesarean section for the classical operation and with it change in the indications for the election of the former. In 28,756 deliveries at the University of Strasbourg during this period 359 low sections were performed but only 146 were recorded in sufficient detail to permit their inclusion in the authors' discussion. Moreover in the 3 excluded there was no maternal mortality.

In the 346 cases reviewed there were 15 maternal deaths, maternal mortality of 4.33 per cent. Six of the deaths were ascribed to peritonitis. Of these, 5 occurred prior to 1917 when the indications for the operation were first modified. In the 43 cases in which the operation was performed in the period from 1917 to 1932 there was only 1 death from peritonitis whereas in the 99 cases in which it was performed in the period from 1908 to 1917 there were 5 deaths from that condition. Also in the early period there were 3 cases of septicæmia, of which 2 were complicated by peritonitis. Of the 6 other deaths in the total number of cases, 2 were due to bronchopneumonia and intrapartum hemorrhage. Both the authors attribute the use of ether anesthesia and believe would not have occurred if spinal anesthesia had been employed, and were due to barbaric practices following spinal anesthesia.



# GENITO-URINARY SURGERY

## ADRENAL KIDNEY AND URETER

Fuchs, F.: The Relation of the Physiology of the Upper Urinary Tract to Elimination (Urography) (La fisiologia delle vie urinarie superiori quale fondamento della urografia per eliminazione) *Urologia*, 1934, 65.

The use of descending or elimination urography has without doubt contributed to an understanding of the physiology of the upper part of the urinary tract, that is to say the renal pelvis and the ureters. On the other hand, the results of elimination urography are very greatly modified by the physiological condition of this part of the urinary tract and elimination programs do not necessarily give an accurate picture of existing conditions as the factors of diuresis and muscle tones cannot be calculated. Changes in diuresis cause a change in muscle tones which affects the images obtained. With the usual technique of elimination urography the filling of the bladder increases during the examination and it is impossible to determine the degree of filling. More over the volume of diuretics during the period of the examination is not known. Accordingly it is impossible to know whether or not changes in the picture of the upper urinary tract are brought about by changes in tone caused by diuretics. The fact that the bladder factor and the diuretic factor may act on the upper urinary tract in the same direction or in opposite directions introduces another cause of uncertainty. It must be borne in mind also that the concentration of the contrast medium in the urine varies during the course of the examination.

A certain exposure time is necessary for roentgenography as the peristaltic wave in the ureter moves about 5 cm. per second. An exposure time of three seconds gives the appearance of a column of urine about 9 cm. long undergoing a uniform peristaltic movement. This may erroneously suggest functional segmentation. By functional segmentation the author means a difference in tone of different parts of the upper urinary tract brought about by changes in diuresis. These various factors often make it impossible to differentiate between normal and pathological conditions in the upper urinary tract. It obtains reliable pictures, and of the conditions of filling of the bladder, is impossible as both of these factors vary during the time of examination. ARTHUR GOME MORRIS, M.D.

Gilbert, J. B., and Macmillan, E. F.: Cause of the Kidney. *A. S. Surg.* 1934, vol. 499.

Gilbert and Macmillan add two more cases of primary squamous-cell carcinoma of the renal pelvis to the fifty five previously reported, and discuss the

relationship of the condition to infection, leukoplakia, and calculi. They advocate removal of these factors as prophylactic measure. The treatment indicated is surgical removal and deep X-ray irradiation.

FRANK M. COOKSON, M.D.  
Mookharinsky, A.: Ureterocoele (De Puntifrodo) *J. Amer. Med. Ass.* 1934, 34, 5.

The pathogenesis of ureterocoele is still the subject of considerable controversy. According to the theory most generally accepted, the cause of the condition is a stricture or atresia of the vesical orifice of the ureter, but according to some urologists the presence of a valve balled the orifice, the angle formed by the ureter with the wall of the bladder or insufficient muscular development of the intramural portion of the ureter is the sole cause or a contributory cause.

A structure was found in all of the eight cases reviewed by the author in three cases, the ureterocoele, even though bilateral, was not congenital but the result of inflammation or traumatism. Mookharinsky believes that stricture is the factor of chief importance. It traces the development of ureterocoele to the presence of a stricture and gives brief discussion of the various methods of treating the condition.

NATHAN A. WOMACK, M.D.

## BLADDER, URETHRA, AND PENIS

Franceschi, E.: Technical Note on the Extraction of Foreign Body from the Bladder by the Natural Route (Corpo estraneo vescicale. Estrazione per la via naturale. Nota di tecnica) *Urologia*, 1934, 85.

A woman came for treatment for what had been diagnosed as uterine hemorrhage. She stated that she had introduced a semi rigid sound of silk and rubber with an olive tip into the uterus, the sound had been introduced into the uterus, being located in the bladder. Although it had been introduced only three days previously it was heavily encrusted with phosphates. It was removed by Hegar dilator and then turning the sound with the finger until it could be grasped with the forceps and removed.

ARTHUR GOME MORRIS, M.D.

## GENITAL ORGANS

Morison, A. C., and Bempsey, J. E.: A Study of the Craftsmanship of the Harris Technique for Prostectomy. *Brit J. Urol.* 1934, 6, 207.

The authors report forty cases in which prostatectomy was performed by the Harris technique with

## GENITO-URINARY SURGERY

two deaths. In none of the cases was it necessary to open the bladder for the control of secondary hemorrhage. The authors have observed that patients operated upon by the Harris method are much more fit during the first few days after the operation than similar patients operated upon by the Freyer or Thomson-Walker technique. Harris advocates a transverse incision, but the authors employ a vertical incision. Bilateral section of the vas is done and the seminal vesicles are washed out with a 1:60 solution of carbolic acid.

Intra-urethral enucleation of the prostate is carried out. Hemorrhage is controlled and the floor of the urethra reconstructed as described by Harris. A urethral catheter is left in place and the bladder irrigated every hour for the first day. The bladder is either closed tightly or a small rubber suprapubic drain is left in. When tight closure is made, the suprapubic space is drained.

By this method shock and hemorrhage are lessened and convalescence is shortened.

THEOPHIL P. GRAUER, M.D.

**Franceschi, E.** A Contribution to the Study of True Prostatic Calculi (*Contributo allo studio della calcolosi prostatica vera*). *Arch. ital. di urol.*, 1934, 11: 366.

A review of the literature reveals that true stones in the prostate are not common. The author reports a case in which a prostatic stone was removed.

He states that stones may be present in the prostate for many years without producing clinical symptoms even when they are of the racemose type. They may develop independently of prostatism or with that condition. Often prostatism masks the presence of stones until congestive or infective factors result in mobilization of the stones with the production of symptoms due to irritation. Even the most accurate X-ray technique may fail to visualize the calculi, especially when they are situated deeply or are composed almost exclusively of urates. When mobilized, prostatic stones may be felt with the finger or an exploring sound.

Surgical removal of these stones when they are causing symptoms is accomplished easily by the suprapubic route even when they are situated deeply. As a rule it is possible to find a plane of cleavage representing the division between the zone of infiltrated tissue and the normal prostate. Occasionally it may be necessary to remove or incise an adenoma simultaneously.

A. LOUIS ROST, M.D.

**James, T. G. I., and Matheson, N. M.** Observations on Carcinoma of the Prostate. *Brit. J. Urol.*, 1934, 6: 235.

The authors report some unusual manifestations of carcinoma of the prostate which they found in a study of about fifty cases of that condition. In one case the carcinoma spread to the perineum where it formed an indurated lump the size of a walnut which was continuous with a stony hardness involving the proximal part of the corpus spongiosum. Another

case presented nodules on the skin of the lower part of the abdomen and a nodule on the forehead. As a rule only the regional glands are involved early in carcinoma of the prostate, but in one of the cases reviewed involvement of practically every group of glands in the body was found on clinical examination and at autopsy. Bone metastases were found in nearly all late cases. The pelvis was the first bony structure attacked.

DONALD K. HIBBS, M.D.

**Mintz, E. R., and Smith, G. G.** Autopsy Findings in 100 Cases of Prostatic Cancer. *New England J. Med.*, 1934, 211: 479.

In the cases of early carcinoma reviewed no evidence of metastases was found. In the more advanced cases extension occurred most rapidly to the pelvic or retroperitoneal nodes, next most rapidly to the bladder and seminal vesicles, and least rapidly to the bladder and lymph nodes. Visceral metastases occurred most frequently in the lungs and liver. Osseous metastases were found in nearly 50 per cent of the cases.

DONALD K. HIBBS, M.D.

**Aberle, S. B. D., and Jenkins, R. H.** Undescended Testes in Man and Rhesus Monkeys Treated with the Anterior Pituitary-Like Principle from the Urine of Pregnancy. *J. Am. M. Ass.*, 1934, 103: 314.

In the treatment of cryptorchidism a third possibility has been presented, namely, the administration of the anterior pituitary-like principle from the urine of pregnancy. In most mammals the testes can develop normally only in the scrotum. Sooner undescended testes are placed in the scrotum the better are the chances for normal function. Operative procedures have given satisfactory results in from 50 to 60 per cent of cases of cryptorchidism.

In experiments reported by the authors, six monkeys were used, one of which served as a control. A total dose of approximately 2,500 rat units of the hormone from the urine of pregnancy was given to each. Complete descent of the testes occurred in one and partial descent in four. In the cases of partial descent the fascia about the vas deferens and spermatic vessels was found to be short.

The authors report also the intramuscular injection of the hormone in the cases of five boys ranging in age from three to thirteen years. In the first case discontinuance of the treatment was rendered necessary by a marked febrile reaction after the administration of 150 rat units. In the second case there was no change in the position of the testis after the administration of 1,000 rat units, and nausea, vomiting, and pain in the inguinal region occurred after each injection of 100 rat units. In the third case the first injection was followed by fever and gastro-intestinal disturbances. The testis, scrotum, and penis increased in size, but there was no change in the position of the testis after the administration of 2,750 rat units. In the fourth case the testis descended to a midscrotal position after the administration of 4,525 rat units. In the fifth case,

## INTERNATIONAL ABSTRACT OF SURGERY

In which there are two temporary reactions to the injections, the testis descended to the lower part of the scrotum after the administration of 700 rat units. In no case was there any change in the secondary sexual characteristics.

Rubinstein, H. S. The Production of Testicular Descent with the W for Sol ble (Anterior Pituitary-Like) Fraction of Pregnancy Urine. *Endocrinology* 934, 8, 475

Until relatively recently there has been no method for the correction of undescended testicle except surgery. As surgery has not always been highly successful in lengthening the cord, the problem has been attacked from the medical standpoint. Schapiro and Eagle had fair success in treating partially undescended testicle by the injection of Aschbach-Zondek pre-hormone and extract of the anterior lobe of the pituitary gland. The successfully treated cases were those in which the testicles were in the inguinal canal. The author reports cases in which the treatment was successful when the testicles were intra-abdominal.

The patient was a boy ten and half years old born at term and at birth weighed 8 lb 4 oz. He was delivered at high forceps. At age 11 as a five and a half month old he stood at the age of eleven months, talked at the age of fifteen months, and walked at the age of sixteen months. His present growth was noticeably large and he became progressively more obese. According to his history he did not play boys games of physical prowess.

Physical examination disclosed obesity of the pelvis and shoulder-girdle type. The fingers of the tapering. On neurological examination the cremasteric reflex was absent because of absence of the testicles from the scrotum. The penis as extreme small, only 1/4 cm in length, and nearly buried in the fat of the mons pubis. The testicles could not be palpated in either the scrotum or the inguinal canals. There was a history of marked polydipsia, polyuria, nocturia, and enuresis. A diagnosis of trophic diabetogenic and bilateral undescended (intra-abdominal) testicle was made.

The patient was treated on an endocrine basis, being given daily intramuscular injections of a water soluble fraction of pregnancy urine. After six injections the left testicle was found in the inguinal canal and the next day the right testicle was found in the inguinal canal. A few hours later the enuresis stopped. The injections were continued daily for 1 month and then given three times a week. After six months the left testicle was completely in the scrotum, the right testicle was partially descended, the penis had increased to 4 cm in length and the child had taken up boy sports such as football.

The above reports also experiments which have been carried out with rats to determine the effect of

this hormone treatment on immature animals. The rats were all younger than forty days, the age at which testicular descent occurs in that species. Controls were used for each group. The duration of the treatment ranged from thirteen to twenty-two days. At the end of the treatment the animals were killed and weighed and the testicles, penis, and pituitary gland were carefully dissected out and weighed. In all of the treated animals these organs were larger and heavier than in the control animals. The seminal vesicles of the treated animals were found distended, but no spermatozoa were discovered.

Henline, R. E. The Differential Diagnosis and Treatment of Tumors of the Testicle. *J. Urol* 934, 3, 177

The rapid progress and favorable prognosis of testicular tumors makes early diagnosis imperative. Cases of testicular swelling in men between the ages of twenty and fifty years, with or without a history of trauma or infection, malignancy should be suspected. In the presence of malignancy the testicle is large and firm, and occasionally nodules or areas of softness are palpable. The tumors are freely movable and not tender. The tumors are freely movable and separation before the tumor is necrotizing. Early blood-stained fluid in the tunica vaginalis indicates invasion of the epididymis. In early cases the cord is normal or only slightly indurated. A mass reaction or a week of antibiotic therapy is indicated. Primary involvement of the epididymis occurs early and there is later mass formation. The epididymis is nodular and the vas is often beaded like a string. In many cases the seminal vesicles and prostate are involved.

Gonorrhea, tuberculous, and other scrotal lesions have frequently been confused with testicular tumor. Occasionally there has been confusion with metastasis of proper treatment. With the discovery of the sex hormone of the anterior lobe of the pituitary gland (Protein A) in the urine of men with testicular tumor, correct diagnosis may be made promptly. By quantitative estimation of the Protein A excreted, not only the presence of tumor but also the type of the neoplasm may be determined before treatment is instituted or biopsy is done. The radioactivity of the tumor may also be determined before this. First, the original amount of Protein A excreted is determined. The tumor grows and lower doses of high voltage x-ray irradiation. If the hormone output drops sharply after the irradiation the tumor is radioresistant and the prognosis is good. If the tumor is radiosensitive and the prognosis is poor, the prognosis is unfavorable. When under the latter circumstances there is no demonstrable metastasis, the testicle may be removed and the



# SURGERY OF THE BONES JOINTS, MUSCLES TENDONS

## CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Fraser J. Acute Osteomyelitis. *Brit. M. J.* 1934, 139.

The author suggests that the localization of an abscess in the bone marrow although creating difficult and regrettable situation so far as the local infection and suppuration are concerned may have a salutary effect as it may be the body's method of producing a defensive area from which the factors of immunity may be developed. He argues that general blood-borne infection may have less serious consequences if the infection becomes localized in a bone abscess. As there is growing belief that the reticulo-endothelial tissue is one of the most important defensive mechanisms of the body the fact that this tissue is concentrated in the metaphyseal areas of the long bones explains the frequency of the localization of bone infection in those areas.

In discussing the operative treatment of acute osteomyelitis Fraser states that he is conservative. He advocates the Starr technique though in form even less extensive than that advised by Starr. He is disappointed with the gutter operation and is opposed to all of the more radical procedures with wide debridement or subperiosteal resection. In the bone involved by acute osteomyelitis he makes numerous 3/4 in. drill holes up to the healthy bone area, using a freshly sterilized drill for each hole to avoid extending the infection. The wound in the periosteum and soft tissue is left entirely open and lightly packed with sterile gauze soaked in a solution of liquid paraffin, acriflavine, and potassium citrate. The limb is then immobilized in plaster for six weeks. At the end of that time a dressing is done under anesthesia, the wound repacked, and plaster applied for from four to six weeks. On removal of the plaster the wound is re-examined, any sequestra formed are removed, and an attempt at partial closure is made.

In fifty-six cases treated by Fraser in the last twelve years there were thirteen deaths, mortality of 23 per cent. In the fatal cases there had been a progressive septicemia which ultimately changed to pyemia with secondary abscesses in the voluntary muscles, subcutaneous tissues, heart, lungs, and brain.

ROBERT C. LOWENKOPF, M.D.

Gambos, M. Sclerosing Osteomyelitis (Osteomyelitis sclerosans). *Bol. y trab. Soc. de ciruj. de Buenos Aires* 1934, 2: 227.

The author reports a tumor involving the upper half of the left tibia of a boy fourteen years old. Roentgenograms disclosed sclerosing lamiform lesion joining the cortex. Before the patient con-

sulted Gambos he had been given intensive antisyphilitic treatment in spite of the absence of serological and other clinical evidence of syphilis. This treatment had negative results. Gambos removed the area of sclerosis surgically. The operation was followed by almost immediate relief, and twenty months later the patient was apparently cured.

In Gambos' opinion, this was a case of the sclerosing osteomyelitis described by Garré.

The disease usually occurs in the last years of childhood. It is more frequent in boys than in girls and affects the bony diaphysis, especially that of the tibia. There may be multiple lesions. The area of bone affected hypertrophies with considerable thickening and proliferation of the cortex and forms a solid mass which invades and narrows the medullary canal, in some cases obstructing it completely.

The onset of the condition may be insidious or acute with local pain and elevation of the temperature. The pain is usually aggravated at night. As a rule there is no appreciable tumefaction and at times a slight edema of the soft parts.

The roentgenogram shows widening and an increase in the density of the diaphysis. The outline of the lesions is smooth and regular. The medullary canal may be narrowed or obstructed.

The prognosis is uncertain. The symptoms may subside spontaneously even though normal bone structure may not be obtained. The most satisfactory treatment is surgical. The operation may consist in the formation of multiple bones through the lesion into the medulla or resection of the affected area of bone.

W. H. MARTINEZ, M.D.

Bernardini, R. Roentgen Examination of Brodie's Chronic Bone Abscess (L'indagine radiologica nello studio degli ascessi cronici delle ossa—Brodie). *Gior. chir.* 1934, 777.

In 1824 Brodie found, after amputating a leg, that the operation was unnecessary as the condition was merely a bone abscess. Thereafter to prevent another such error he spent twenty years in a study of bone abscess and wrote a detailed description of chronic bone abscess. Many abscesses to which the term Brodie's chronic bone abscess has been applied do not belong to that classification. Brodie described only abscesses which are chronic from the beginning and caused by pus cocci of limited virulence, whereas many of the abscesses described as Brodie's abscess in the literature are abscesses due to acute osteomyelitis which had become chronic in the later course of that disease. Brodie stated that the abscesses he described were located chiefly in the metaphyses of the long bones and caused intense intermittent pain with exacerbations at night.

The author reports six abscesses which he thinks were of the Brodie type although they were not all located in the metaphyses. He supplements the case histories with roentgenograms. He believes that the designation "Brodie's abscess" should include all chronic bone abscesses with a slow course which are caused by bacteria of attenuated virulence, whether they are located in the metaphysis or epiphysis or occur beneath the periosteum. He states that these abscesses never affect the marrow for if the process reaches the marrow, an acute osteomyelitis develops.

AUDREY GOSS MORGAN, M D

Bonola, A. The Clinical, Roentgenological, and Histological Picture of Dyschondroplasia (Il quadro clinico, radiografico ed istologico della discondroplasia). *Chir d organi di movimento*, 1934, 19, 101.

In 1899 Ollier described as "dyschondroplasia" a pathological entity characterized by irregularity of development, evolution, and distribution of cartilage in bone. The disease is associated with an abnormal and atypical proliferation of cartilage, both intra-medullary and subperiosteal. It occurs most frequently near the epiphyses of the long bones and is usually unilateral. The strictly unilateral type is now referred to as the "Ollier type." Only thirty-three cases of the Ollier type have been recorded.

The pathogenesis of dyschondroplasia is not known. Among the many factors to which the disease has been attributed are disturbances of the developing cartilage *in utero*, dysfunction of the endocrine glands, particularly the thyroid and sex glands, disturbances of the sympathetic and central nervous system, and disturbances of the sympathetic nerve supply to the nutrient artery of the bone.

The author reports six cases in detail. The patients were males ranging in age from one to fifteen years. There was no evidence of a hereditary factor, syphilis, tuberculosis, or a change in the sympathetic or central nervous system. One patient was an epileptic. All of the patients were normally nourished and developed in infancy. Dental dystrophy and blue sclerae were common. One patient presented facial asymmetry with the less developed parts on the side of the dyschondroplasia.

The development of the clinical picture may be divided into three stages: the initial, the evolutionary, and three progressive. In the initial stage the extremity gradually becomes noticeably shorter. In the lower extremity the shortening becomes clinically evident between the third month and the fourth year, and in the upper extremity between the third and ninth years. Often there is no enlargement of the metaphyses and no disturbance of motility. Subjective symptoms are absent. In this stage X-ray examination is essential for the diagnosis as without it the condition is usually mistaken for rickets. The lesions are most marked and most frequent in the more rapidly growing metaphyses, i.e., the distal at the elbow and the proximal at the knee. In the upper extremity they are often found at the radio-ulnar

metaphyses and as a rule only one of the two bones is involved.

During the evolutionary stage of the condition the metaphyseal lesion extends and the deformity becomes increased. The difference in growth results in a difference in length. Simultaneously, the mass at the metaphysis increases in size. Both changes are progressive.

During the period of involution there is complete arrest of the growth of the extremity. The metaphyseal tumefaction decreases in size as it ossifies, but the deformity and shortening persist.

Complications, which are not infrequent, include pathological fractures, which often follow an insignificant trauma and heal slowly, and the development of associated enchondromata, especially in the bones of the hand.

Roentgen examination should include the entire skeletal system. As a rule all the metaphyses and epiphyses of one side are involved from the beginning. In about 50 per cent of the cases the condition is unilateral. In the bilateral cases one side is involved much more than the other. The changes occur most frequently in the metaphyses of the long bones and in cortical bone. In the initial period there are small oval transparent areas surrounded by more compact bone. The cartilaginous bodies are distributed according to the trabecular architecture and the distribution of the blood vessels in the metaphysis. In rare instances the marginal lesions are not bounded by cortical bone and have the appearance of excavations in the bone. Gradually, in the period of evolution, confluence of the individual lesions occurs with an increase in the size of the cartilage often associated with complete disappearance of the trabecular markings. The involutionary changes include calcification in the cartilaginous masses and an intense periosteal osteogenesis which tends to delimit, circumscribe, and replace the newly formed cartilage.

The author discusses the histological changes on the basis of biopsy specimens studied during the different stages of the disease. The process consists essentially of a slow proliferation of cartilage with destruction of bone and the later occurrence of calcification and degenerative changes in the cartilage. The healed stage is reached between the ages of twelve and sixteen years, at which time there is complete arrest of growth in the extremity.

The treatment is not well developed. No medical cure is known. Corrective shoes may be used early. After healing and arrest of growth various corrective operations may be indicated. Operations to arrest the growth of the normal extremity may be considered early.

To explain the new cartilage growth the author suggests that the cartilage in the epiphyseal region may lose the power to become bone and as the result its growth becomes uncontrolled. The occurrence of the condition during puberty suggests that enchondral ossification may be hindered by an endocrine disturbance.

A. LOUIS ROSI, M D



Mauro, M. Arthritis in Hemophilia. A Contribution on Its Pathogenesis, Clinical Aspects, and Treatment (La artritis emofílica. Contributo allo studio patogenetico, clinico terapeutico). *Arch Med di chir* 1934, 15: 577.

The author reviews briefly the pathogenesis and clinical picture of hemophilia. He states that hemarthrosis, one of the severe complications of this disease, may develop after the slightest trauma or even spontaneously. It may occur in any joint, but is most common in the knee. Of thirteen cases of hemophilia observed by the author three had articular manifestations. Mauro reports a case of typical hemophilia with severe changes in the soft tissues of the foot in which he operated with a good result. In discussing the surgical treatment of the disease he emphasizes the value of transfusion and injections of blood serum supplemented by folliculin, pituitary extract, hypotonic salt solution, and calcium.

ROMANA T. LAMOT, M.D.

Mitch, H. I. So-Called "Primary" Tuberculosis of Muscle. *Am J M Sc* 1934, 85: 4.

The case reported by the author was that of a woman twenty-eight years old who was admitted to the hospital with a swelling behind the left knee. The patient had been under observation for many years because of Pott's disease with collapse of the lower thoracic vertebrae. About ten years ago she developed symptoms in the right knee and a plaster of Paris bandage was applied with resulting stiffness of the joint. Pain and enlargement of the left knee began without apparent cause about one year before she consulted the author.

Examination of the left knee revealed, below the medial condyle of the tibia, a tense elliptical semi-elastic swelling 10 cm. long from which no fluid was evacuated on aspiration. When excised, the mass was found to be localized to the inner head of the gastrocnemius muscle. No connection between it and the knee joint could be discovered. The operation was followed by uneventful recovery.

Pathological study of the excised mass disclosed the gross and microscopic picture of tuberculosis. In a review of the literature up to 1931 Hanks found the reports of fifty-five cases of tuberculosis of muscles in which the condition did not occur by direct extension. In most of the cases muscles of the extremities were involved. These included the quadriceps, gluteus, palmaris longus, biceps, triceps, flexors and extensors of the fingers, and abductor pollicis. Among the muscles less frequently involved were the sternomastoid, pectoralis, rectus abdominis, and lumbar muscles.

ROMANA T. LAMOT, M.D.

Bravo y Diaz-Cabedo, J. Malacia of the Navicular Bone of the Wrist (Malacia del hueso escafoide del carpo). *Arch de med chir y especial* 1934, 5: 932.

The author reports three cases of malacia of the navicular bone of the wrist, supplementing the histories with roentgenograms. He states that

malacia of the wrist affects chiefly the lunate and navicular bones and the former much more frequently than the latter. It generally develops in healthy men and is more common in the right than in the left wrist. The subjects are generally between twenty and thirty years of age and rarely younger than seventeen. The majority are manual workers. In about 50 per cent of cases there is a history of trauma. The lesion is often caused by falling with the hand in extension. In some cases it is caused by frequently repeated slight trauma. Occasionally it begins without known cause.

The first symptom is pain on movement of the joint and on pressure. Pain over the anatomical snuff-box is characteristic. Sometimes percussion of the first and second metacarpals is painful. Lateral pressure is painless. The movements of the joint gradually become limited. There is slight swelling over the bone due to reactive edema around the bone. In the beginning the roentgenogram shows normal structure. In some cases fine fracture lines can be seen. Frequently this is apparent only in the radio-clear projection. After some months gross changes appear in the structure of the bone. There is a diffuse enlargement of the bone which becomes evident only when the involved bone is compared with the bone of the normal wrist. There are alternating clear and opaque zones. Finally a sequestrum may be formed. After while all or a part of the bone breaks down. Later new bone is formed, the clear areas disappear, and the bone takes on normal structure though it is smaller.

The course of the disease is very chronic. As the condition generally does not cause very severe symptoms the bone is rarely extirpated for histological examination. Recently it has been extirpated in certain cases to prevent arthritic deformities. Histological examination in such cases has shown a necrotic central area bounded by a connective tissue capsule containing giant cells which invade the necrotic part and bring about new formation of bone.

The author discusses the various theories with regard to the cause of the disease. None of them has been definitely proved. The fractures may be secondary to the disease rather than the cause of it.

Roentgenograms of the navicular bone are best taken in the dorsopalmar projection with maximum lateral flexion of the hand toward the ulnar side, the thumb in slight abduction, and the central ray focused on the navicular bone. This position prevents superposition of other bones which, in the usual projection, interfere with a clear picture of the navicular bone. The normal side should always be examined at the same time.

In some cases treatment by immobilization and rest for from six to eight weeks is sufficient, but in order to prevent complication by arthritic deformities extirpation of the bone is sometimes performed. One of the author's cases was treated successfully by perforation of the bone. This procedure gives exit to the effusion within the bone, opens up routes for

# SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

51

the penetration of newly formed vessels which is necessary for regeneration of the bone, and places the periosteum in contact with the bone marrow

AUDREY GOSS MORGAN, M D

**Zampetti, M. Acute Osteomyelitis of the Ribs**  
Caused by Ordinary Pus Cocci (Ulteriore contributo allo studio dell'osteomielite acuta delle coste da comuni piogeni) *Clin chir*, 1934, 10 727

The author reports 10 cases of acute osteomyelitis of the ribs which he treated in the last ten years and summarizes briefly in tabular form 92 cases which he collected from the literature. He attributes only about 100 cases in the literature. He attributes the paucity of reports of the condition to the fact that the diagnosis is very difficult and is generally not made until operation is performed. He believes it possible that many mild cases are not diagnosed at all, and that many surgeons do not report their cases, particularly when the original diagnosis was erroneous and the operation was simple.

Roentgen examination does not give characteristic findings. It is always difficult and often impossible to demonstrate that a thoracic or lumbar abscess originates from osteomyelitis of the ribs. Chemical and biological methods are of little aid in the diagnosis. The abscesses are usually caused by the staphylococcus pyogenes aureus. They occur most frequently in children and in the seventh rib.

A sequestrum was formed in 26 of the 92 cases which the author collected from the literature and in 4 of his own 10 cases.

The prognosis is good. The mortality is about 10 per cent and always due to sepsis or pyemia. It could be reduced if the diagnosis could be made early before sepsis begins.

AUDREY GOSS MORGAN, M D

**Uhrmacher, F. Variations of the Skeleton of the Foot as a Basis of Foot Disorders (Variationen des Fuss skelets als Grundlage von Fussbeschwerden)**  
*Ztschr f orthop Chir*, 1934, 61 180

In cases in which, in spite of the best inserts and careful treatment for weak foot or flat foot there were still disturbances of gait and typical pains localized to the medial side of the tarsal navicular bone roentgenography revealed an enlargement of the navicular tuberosity. In the cases of children and adolescents this was demonstrated also by palpation. The tuberosity was bent into a horn shape and lay posteriorly around the talus. Just like a true os tibiale externum, the horn shaped navicular bone lifted the tendon of the tibialis posticus from its normal bed and forced it into an almost straight upward course. Among 200 cases of foot trouble due to various infections and bone changes which were admitted to the author's clinic in 1933 there were 32 cases of unilateral or bilateral os tibiale externum of varying size, 2 cases of os peroneum, and 1 case of calcaneus secundarius.

The author believes the frequency of os tibiale externum to be 16 per cent. Whereas formerly the treatment was usually conservative, today, es-

pecially in the cases of children and adolescents, the restoration of physiological conditions is accomplished by operative means. Most of the patients are in the second and fourth decades of life. In adolescents, growing pains are frequent. According to recent investigations, the os tibiale externum develops not only gradually by growing out of the tendon of the tibialis posticus to form an independent accessory bone, but develops also upon a chondroid or fibrocartilaginous as well as a hyaline cartilaginous base in this tendon. This site becomes ossified as the result of the penetration of blood vessels and the formation, in the center, of cortical bone which places the peripheral fibrous bone and the os tibiale externum between the navicular bone and the os tibiale externum. During the first decade of life the union consists of the tendon of the tibialis posticus and later of chondroid or fibrocartilaginous or connective tissue or fusion of the 2 bones.

Some orthopedists, among them Latten, have regarded the connecting bridge between the navicular bone and the os tibiale externum as the cause of the symptoms and accordingly have interpreted the pains as growing, dragging, or shearing pains. In contrast to Francillon who concluded that the pains develop in the "joint" between the navicular bone and the os tibiale externum as the result of the weak proliferative processes of the islands of cartilage occur in the region of the joint with increased growth of the organism. In the cases reviewed arthritic changes were never found. The tendon of the tibialis posticus, which was usually lifted from its bed, was displaced upward. The sustentaculum projected prominently under the medial horn of the navicular bone as a small protuberance. In the distal portion of the tendon, there were dragging pains which in some cases were associated with a locally circumscribed tendovaginitis. Because of the swelling and reddening, an incorrect diagnosis of infected foot was sometimes made. As a result of the increasing torsion of the calcaneus, the talus slips under the tendon downward and inward and painful flat-foot develops.

For relief, the author recommends extirpation of the os tibiale externum or chiselling off of the horn according to the operative method of Schede. An arch shaped skin incision is made over the lower border of the navicular bone and another skin incision along the tendon of the tibialis posticus. The tendon sheath is then opened and the aponeurosis of the posticus separated from the os tibiale externum with a thin lamella of bone. The superfluous bony parts of the latter and those of the horn are chiselled off. The tendon sheath of the flexor hallucis is opened for a distance and the tibialis posticus is introduced so that it again runs under the sustentaculum tali. As a result of the plantar displacement of the aponeurosis, the tibialis posticus acquires the proper tension.

On completion of the operation the foot is placed in a plaster cast in slight adduction and supination.

Weight-bearing is allowed after from four to six weeks. In some cases high insert must be on for six months. The after treatment is the same as for contracted flat foot.

The operation is usually done in the second or third decade of life. In the cases of small children, a ribbed insert is usually sufficient, but in those of older patients an individually suitable insert must be worn and, in addition, treatment of the foot is necessary.

The site of the disturbance is shown by roentgenograms and a drawing.

(H. Ewert.) LOUIS MEYER, M.D.

### SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Milich, H., and Ralston, V. Arthroscopy of the Knee Joint. *Ann Surg* 934, no 357

Of 50 cases in which arthroscopy of the knee joint was done, postoperative infection occurred in 3 (5 per cent). In the cases in which the Lane technique or a modification thereof was used, the incidence of postoperative infection was 3.3 per cent, and in those in which ordinary surgical procedures were followed it was 4 per cent. With regard to the relation of the experience of the surgeon to the incidence of postoperative infection it was found that the frequency of infection varied indirectly with the surgeon's experience, regardless of the technique employed. The authors conclude that reliance on the Lane technique is illusory and adherence to its ceremonial superfluous.

The reviewed cases show also that the duplicate skin preparations are unnecessary; the incidence of postoperative infection after the single preparations being 3.6 per cent whereas after the double preparations it was 7.7 per cent. However, the duration of frequency of postoperative infection. When the operation lasted less than forty minutes the incidence of infection was 3.7 per cent, whereas when the operation lasted over forty minutes it was 9 per cent. Infection was more frequent in cases in which a longitudinal incision was used than in those in which a transverse or spilt patella incision was employed. The more extensive operations such as synovectomy and repair of the crucial ligaments were, of course, followed by infection more frequently than the simple procedures.

The authors conclude that the fear of opening the knee joint which is based on the poor results of operations performed many years ago is no longer justifiable.

WILLIAM ARTHUR CLARK, M.D.

### FRACTURES AND DISLOCATIONS

Murray C. R. The Healing of Fractures: Its Influence on the Choice of Methods of Treatment. *Arch Surg* 934, no 410

The author discusses the modern conception of fracture healing in its relation to the clinical care of

fractures. The following problems, of academic interest, are covered in the bibliography: (1) the existence or non-existence of specific bone-forming cells or osteoblasts; (2) the occurrence or non-occurrence of metaplasia of connective tissue cells into osteoblasts "on demand"; (3) what connective tissue cells, if any, are capable of such metaplasia; (4) whether a cell of any kind has an active specific part in the process; (5) the existence of a specific osseous substance or matrix; (6) the presence or absence of enzyme activity in the mechanism of calcium deposition; and (7) the source of any enzyme involved.

In the body of the article Murray discusses ( ) observations sufficiently well supported to be applied clinically; ( ) the supportive evidence, and (3) the influence of these observations on the treatment.

The observations cited are: ( ) the nature of the healing process, (2) variations in the character and amount of healing and the local nature of the factors involved—local pathological changes, granulation tissue growth, the local source of calcium, and the breakdown concentration of the tissue fluid, and (3) the lack of influence of factors involving the individual as a whole.

The author gives his opinions as to how methods of treatment can reflect the various factors cited and the nature of the benefit.

BARBARA B. STENOG, M.D.

Peyton, W. T. Copenhagen IV and Army L. A Quantitative Study of the Rate of Healing in Bone. II. The Normal Rate of Healing. *Arch Surg* 934, no 405

The authors report experiments which they carried out on rabbits to establish the normal rate of healing definitely in order that they might be able to estimate the amount of variation produced by factors supposed to influence bone healing. They propose to check their results by another series of experiments in which a greater number of factors will be held constant.

The experimental method used has been described previously. In determining the return of strength in healing bone, the tensile strength, resistance to torsion, and resistance to bending are measured. The fractures are produced in the ulna of one leg and the ulna of the opposite leg was used as control.

The results with regard to each of the factors and the eight of the bone are carefully analyzed and shown in graphs and tables.

It was found that, as regards tensile strength, healing was complete by approximately thirty days after the fracture, but within the limits of the experiment the broken bone never completely regained the tensile strength equal to that of the control bone of the opposite leg. The resistance to torsion and bending, as completely regained by approximately sixty days after the fracture.

BARBARA B. STENOG, M.D.



# SURGERY OF THE BLOOD AND LYMPH SYSTEMS

## BLOOD VESSELS

Ochsner, A., and Mahorner, H.: The Comparative Value of Intravenous Sclerosing Substances. *Arch Surg* 934 29 397

The investigation reported in this article was continuation of that reported by Ochsner and Gar side in 93. Ochsner and Mahorner employed the following sclerosing agents: their own sodium morrhuate in 5 and 0 per cent solution 5- and 3 per cent solutions of sodium gynocardate 5- and 3 per cent solution of sodium hydrocarbate, and a The technique used was the same as that employed in the investigations by Ochsner and Gar side which consisted of the intravenous injection of the sclerosing agent and microscopic study of sections of the veins removed from one half hour to eight weeks after the injection.

The changes occurring in the intima following the injection of sclerosing agents consisted of either complete destruction of the intima or less marked changes such as pyknosis, vacuolization, and ex plosure of the nuclei. Thrombosis did not occur in endothelium. The highest incidence of thrombosis (74 per cent) occurred in veins in which 5 per cent solution of sodium morrhuate (Searle) was injected. Of the veins treated with 5 per cent sodium gynocardate, 75 per cent showed some endothelial destruction but thrombosis was present in only 50 per cent. The incidence of thrombosis following the use of the various solutions was as follows: 5 per cent sodium morrhuate in benzyl alcohol (Searle) 74 per cent 5 per cent sodium gynocardate 50 per cent 5 per cent sodium gynocardate 50 per cent 5 per cent sodium hydrocarbate 44 per cent 5 per cent sodium morrhuate (authors own) 33 per cent and 3 per cent sodium hydrocarbate 33 per cent. The authors believe that possibly the reason for the discrepancy between the results obtained following the injection of their own sodium morrhuate and the results obtained with the use of commercially prepared sodium morrhuate is that the latter contains benzyl alcohol and the benzyl alcohol may enhance the sclerosing property of sodium morrhuate. When the results of this investigation are compared with those of the investigation carried out by Ochsner and Gar side it is seen that the commercially prepared 5 per cent sodium morrhuate, 5 per cent sodium gynocardate, and 3 per cent sodium gynocardate were all more efficacious than 40 per cent sodium salicylate which was the most efficacious of the drugs studied previously. Definite evidence of the ingress of fibroblasts into the periphery of the thrombus was ob

served after forty-eight hours, and organization with recanalization seemed to be complete after from ten to fourteen days. The findings in the internal elastic lamina varied from complete destruction to no change at all. Edema was frequently noted in the media.

In conclusion the authors state that of the 29 solutions investigated—20 included in the original report of Ochsner and Gar side and 9 included in this report—those found to be the most efficacious were 5 per cent sodium morrhuate prepared in benzyl alcohol (Searle) and 5 per cent sodium gynocardate. None of the investigated solutions had any effect on the coagulation of the blood per se, thrombosis being dependent upon destruction of the endothelium of the vessel.

Piccoli, G. Traumatic Thrombosis of the Right Axillary Vein (Trombosi da sforzo della vena ascellare destra). *Chir e organ di movimento* 934, 22, 86.

A man twenty-one years of age obtained a job in which it was necessary for him to use his arms in producing great force on a lever. About ten days after beginning this work he noticed that his right arm was larger than the left because of a diffuse swelling of the entire arm and the corresponding shoulder. He then remembered that a few days previously he had suffered an unusual strain of the upper arm. The hand and a large part of the arm were intensely cyanotic. The veins of the arm, the thorax and part of the upper right half of the thorax were discolored. Subjectively the arm felt very heavy and full.

On physical examination the arm was found increased in size. The right shoulder had a more convex outline than the left. The right infrascapular and suprascapular fossae were obliterated. The right axillary fold was lower than the left. The right hand and forearm were intensely cyanotic. The veins of the entire extremity, shoulder and right side of the thorax were engorged and right crease of heat in the arm. The swollen tissue did not respond to pressure. Deep palpation in the upper part of the arm revealed a firm cord which was somewhat tender to pressure and could be followed well into the axilla. The axillary lymph nodes were not enlarged but somewhat limited by the sensation of heaviness. There was no evidence of local trauma. Under treatment by rest, cure resulted in forty five days. In discussing the etiology of traumatic thrombosis of the arm the author calls attention to the local anatomy of the axilla and especially the relations of the axillary vein and its tributaries in the region of the costocoracoid membrane. He concludes that in

SURGERY OF THE BLOOD AND LYMPH SYSTEMS

the case reported a sudden forceful muscular contraction may have caused a tearing of the wall of this vessel or the vasa vasorum with resulting injury of the intima

A. LOUIS ROSE, M.D.

A. LOUIS ROSE, M D

BLOOD, TRANSFUSION

Nordenson, N. G. Quantitative Histological Studies of Normal and Pathological Bone Marrow (Histologische quantitative Studien des normalen und pathologischen Knochenmarks) H 562, 1934, 96 193

Intravital methods of examination were introduced into hematological technique by Ghedini, Seyfarth, and Arinkin. Arinkin's method is probably the simplest and has the advantage that the puncture can be made several times. Following the induction of anesthesia and with precautions for asepsis, Arinkin punctured the sternum with a thick needle at about the level of the second rib. Smears were made from the material obtained and stained in the usual manner.

Nordenson made about 170 punctures by Am-  
kun's method. He reports first his findings in the  
cases of persons with a normal peripheral blood pic-  
ture. Like Schilling, he found in several subjects a  
relative lymphocytosis in the absence of pathological  
changes in the bone marrow. Also like Schilling, he  
found in normal bone marrow an eosinophilia of 7  
per cent without a considerable shift. He discusses  
the reticular cells at some length. He believes that,  
when fully developed, these cells are identical with  
the Ferrata cells or haemohistioblasts, and that with-  
out doubt the cells of the myeloid system originate  
from the Ferrata cells.

In summarizing his findings in normal cases, Nor-denson shows by means of curves that the m e lo-blasts are never increased and vary between 0.25 and 5.5 per cent, the myelocytes and promyelocytes between 2 and 21.75 per cent, and the star forms and young granulocytes vary between 3 and 47 per cent. He states that in normal active bone marrow the sum of the staff and young forms is greater than the sum of the myelocytes and promyelocytes. The myelocariocytes are very few, there never being more than 1 to 100 white cells. The number of reticular cells per 100 white cells averages 17; that of normoblasts ranges from none to 2; that of basophilic normoblasts is 6, and that of normoblasts is 70. The author next reports his findings in pathological

70 The author next reports his findings in pathologic material. In anemia with and without a leucocytosis the number of eosinophils is elevated.

In secondary anemia with and without a leucocytosis and with a leucopenia the number of myeloblasts in the bone marrow is about the same as in cases in which the blood picture is normal. In spite of a great change in the leucocyte count in the peripheral blood (up to 17,600) the number of myeloblasts remains constant. The sum of the promyelocytes and myelocytes varies between 11.75 and 41.25 per cent. Myeloblasts are not found. Promyeloblasts occur in the same numbers as under normal

conditions. The basophilic normoblasts are considerably increased, numbering 35 per 400 leucocytes. The normoblasts are not increased. Therefore, according to these findings in the marrow there is an increase in the activity of the erythropoietic system in secondary anemia.

In most cases of leucocytosis and leucopenia—two out of secondary anemia the myeloid system of the bone marrow reacts with a marked percentage increase in the myelocytes and promyelocytes.

In pernicious anemia there is an increase in the myeloblasts from 5 up to 12.75 per cent. The sum of the myelocytes and promyelocytes varies between 20 and 46.25 per cent. On the other hand, the sum of the young and star forms is considerably reduced varying between 0.25 and 10.5 per cent. Megakaryocytes are absent. The reticular cells are increased to 87, the megaloblasts average about 67, and the normoblasts are reduced to about 1 per 100 white cells. The cells of the myeloid system show distinct evidence of degeneration they contain bizarre karyokinetic figures. The latter are seen also in the erythropoietic system. Improvement under liver therapy is evidenced in the bone-marrow picture. The degenerative changes rapidly disappear and the cells regain their normal appearance. The young and star forms increase and soon regain their normal number. In aplastic anemia the sternal marrow is present. On the other hand

In agranulocytosis the sternal marrow is practically devoid of granulocytes. On the other hand, in granulopenia, the marrow is extraordinarily rich in granulocytes and shows considerable activity with a relative increase in the promyelocytes and in platelets. The erythropoiesis is of the type seen in secondary anemia.

In cases of lymphogranulomatosis treated or X-ray irradiation the marrow is poor in cells but not inactive. In aplastic anemia the marrow is poor in cells.

In lymphatic leukemia the marrow is poor in cells and has the appearance of "Flusschasser". The myeloid and erythropoietic systems are practically destroyed, the condition might be described as a "myelo-erythro-pathia." The lymphocytes are few and very young lymphoblasts with a light blue protoplasm without granules are numerous. The reticular cells are numerous but degenerated.

(GERLAGE, HOFMANN L. 1917, M.D.)

the numerous but degenerate  
'GERALD. HOWARD L. M.D., M.D.

Mal'yukov B. The Pathologico-Anatomical Changes in the Organs Following Haemolytic Shock (Ueber die patho-anatomischen Veränderungen der Organe nach hämolytischem Schock). *Vierteljahrsschrift für Naturforschende Ärzte und Naturwissenschaftler*, Leipzig, 1931, 1932.

The author reports the findings at autopsy in four cases of death occurring after transfusion. In two cases an infiltration of the arterial wall by blood pigment collections of sanguinous fluid in the serous cavities of the body and chocolate-colored adipose phenomena indicative of haemolysis were found. The epithelium of the major tubules showed dystrophic processes, and necrosis was found in the

center of the liver lobules. In the two other cases no evidence of hemolysis was revealed by either macroscopic or microscopic examination.

The degenerative phenomena in the kidney tubules was apparently related to protein intoxication due to denaturing of the plasma albumin. The capillaries of the internal organs, particularly those of the liver were overfilled by large numbers of leucocytes.

For proper evaluation of the pathologico-anatomical findings in these clinical cases, fifty-three animals (dogs, cats, and rabbits) were examined after death from artificially induced hemolytic shock. The majority showed an engorgement of the venous system of the abdominal organs indicating disturbances in the lesser circulatory system. Microscopic examination of the capillaries of the lungs revealed masses of albumin, some of which were composed of clots and others of blood pigment. However, these foci disappeared very rapidly from the blood stream and became absorbed by the leucocytes. When death was delayed for a certain length of time degeneration of the epithelium of the kidney tubules and necrosis in the centers of the liver lobules was observed. In the clinical cases however this degeneration and necrosis are not to be attributed to the mechanical obstruction of the vessels by the products of destruction; they are due rather to the atonic condition of the organs, the spasm of the capillaries, or the toxic action of

the decomposition products of hemoglobin. In the prolonged experiments regenerative processes in the epithelial cells and also in the connective tissue were observed. The reaction of the reticulo-endothelial system was evidenced especially in the phagocytizing action of the Kupffer cells of the liver and the reticular cells of the spleen and the lymph nodes.

In the discussion of this report, SKRYNNIA (Moscow) said that the pathologico-anatomical picture in cases of death due to injury from blood transfusion shows that the cause of death is not mechanical obstruction of the kidneys by protein decomposition products but a far reaching intoxication which is responsible for the circumscribed processes in the liver. In 15 of his cases old cirrhotic changes in the liver were found at autopsy and in one case death was due to an air embolus.

ELIASH (Leningrad) said that the mechanical explanation of hemolytic shock cannot be rejected entirely. In some of his cases the blood vessels of the parenchymatous organs showed a flocculation of blood cells suggesting primary agglutination.

MAJILEV (Leningrad) said that while the mechanical factor is of great importance in the rabbit, it is of much less importance in other animals and man. In the dog and in man, flocculation is a reversible process. Severe injuries are caused by intoxication phenomena, but at first the vascular changes are dominant. (KOWKO) HARRY A. SALERMAN, M.D.

# SURGICAL TECHNIQUE

## OPERATIVE SURGERY AND TECHNIQUE, POSTOPERATIVE TREATMENT

Coller, F A, and Maddock, W G Water Balance  
In *Surgical Conditions Internat Clin*, 1934, 3  
190

Water is available to the body from two sources, namely, fluid and solid food. The average adult drinks from 800 to 2,000 c cm of water daily. The water from food is derived not only from the fluid content of the latter, but also from its combustion. Combustion results in the formation of water of oxidation. The water content of the routine daily solid diet is about 1,000 c cm, and that of a soft diet about 500 c cm. In addition, from 200 to 400 gm of water of oxidation are available. When the calorific value of the diet is inadequate the body tissues are oxidized to the extent necessary to meet the metabolic requirements. Under oxidation the body tissues yield water and water of oxidation exactly as does ingested food. Thus in starvation the water content of body tissues utilized yields from 200 to 300 gm of water daily.

Water is excreted in the urine and faeces and by vaporization through the skin and lungs. The waste material excreted through the kidneys amounts to from 15 to 50 gm daily. An individual with normal kidneys must pass not less than 500 c cm of urine daily to rid the body of this waste. In renal disease, in which the kidneys cannot concentrate normally, about 1,500 c cm of urine daily are required for this purpose. The average water loss in the faeces varies from 50 to 150 c cm per day. Vaporization accounts for a loss of from 1,000 to 1,550 gm of water daily.

The authors first studied the problem of dehydration attendant on surgical operations in a series of eighteen cases. They found that the water loss due to vomiting was small except in one case. Blood loss in the operating room was generally much greater than estimated by the surgeon. The loss of water through perspiration in the operating room ranged from 40 to 706 gm. In the four-hour post-operative period, the insensible loss of water ranged from 126 to 828 gm.

The chief fact demonstrated by the study was that the period of operation and immediate post-operative recovery is one of dehydration. Under routine conditions the total fluid loss averaged 1,000 c cm. A little more than 70 per cent of this volume was lost through the skin and lungs, and about 10 per cent was excreted as urine. Elimination of some of the covers in the operating room and on the ether bed reduced the insensible loss of water by one-half and consequently resulted in a greater output of urine.

The authors next studied the water balance during the first days of the postoperative period. They found that in the simple uncomplicated surgical case there was a water loss through vaporization of from 1,000 to 1,500 c cm per day. In septic patients this insensible loss of water amounted to at least 2,000 c cm per day and in patients with hyperthyroidism it approached 2,000 c cm per day. The authors call attention to the fact that there is no reduction in this insensible loss of fluid even when the general supply of water is low. Even when no water is available for kidney function, the water for this heat-dissipating mechanism will be obtained continuously from the body until no reserve is left and death occurs. The kidneys do not take a share of the total supply of available water to make urine, but function with the water that is left over after all other routes of water excretion have had their share.

Accordingly, the best index of adequacy of the water supply is a urinary output satisfactory both in amount and specific gravity. The authors conclude that in the case of the sick surgical patient the minimal daily amount of urine indicative of a satisfactory supply of water is 1,500 c cm. In the cases of patients who are known to have normal kidney function they endeavor to maintain the specific gravity of the urine below 1.05 as an additional check on the adequacy of the intake. They emphasize that in addition to the loss of fluids through vaporization, a great loss may occur through excessive vomiting, diarrhoea, or copious drainage from an intestinal or biliary fistula.

When it is impossible to maintain a satisfactory supply of available water by mouth, the intravenous route is particularly satisfactory in the case of the sick surgical patient. The choice of fluid depends on the substance needed. In combating or preventing simple dehydration the authors use a 5 per cent solution of glucose. In cases with continued loss of gastro-intestinal secretions or with a copious inflammatory exudate such as occurs from burned surfaces, it is necessary to supply lost electrolytes as well as lost water. In the authors' cases of this type the fluid employed is either normal saline or Ringer's solution, 1 liter at a time being alternated with 5 per cent glucose. Determinations of the non-protein nitrogen, chloride, and carbon dioxide combining power of the blood are made at intervals to follow the return to normal levels.

In conclusion the authors state that the use of a 50 per cent glucose solution is advocated only to relieve increased intracranial tension. There have been no complications traceable to the administration of from 200 to 500 c cm of fluid intravenously per hour. Caution should be observed in adminis-



tering fluids intra-venously in patients who have shown or are showing signs of cardiac decompensation.

The article is followed by an extensive bibliography.  
ARTHUR S. W. TUCKER, M.D.

Koch, S. L.: Burn Contractures of the Axilla.  
*Surg Clin North Am* 1934, 14: 73

The principles of treatment of burn contractures of the axilla set forth by Blair Brown, and Hammen are emphasized by Koch. It is desirable to promote healing of the original injury in the shortest time and with minimal scar tissue formation. This is achieved best by repeated moist dressings and the application of Thiersch grafts as soon as a healthy grafting surface is obtained. Such treatment facilitates later correction and in some cases is sufficient. The application of force to prevent contracture may be detrimental as it retards healing, thereby is of great fibrosis.

The simplest method of obtaining the desired situation in axillary contracture is the Z shaped incision. This can be utilized here, a broad sheet of healthy skin extends from the arm to the side of the chest. Frequently such sheets divide into two folds near the axilla with a small area

of normal skin between them. This is always carefully preserved. Because of scar tissue it may be necessary to place the "Z" atypically. Any remaining raw surfaces are covered with split grafts.

When there is no web and the skin adjacent to the axilla is normal, a flap with a broad pedicle may be shifted into the axilla. The remaining raw surfaces on the chest wall or arm may be covered with split grafts, but it is important that normal skin be placed at the site of the greatest tension. If a long flap is used, Koch prefers to raise it in one or two stages before shifting it.

When the burn has involved tissues adjacent to the axilla, Koch does not use tubed grafts from a distance. He prefers the split grafts advocated by Blair and Brown. The use of the latter is the simplest method when the arm is held to the chest without rib formation or redundant tissue. A relaxing incision is made on the chest, all slightly below the false axilla. As undermining proceeds, dissection becomes possible and short skirt like flap comes up to cover the axillary apex. The remaining raw surface being largely on the chest wall, pressure over graft can be maintained suitably.

The author reports on fourteen cases treated as described.  
THOMAS W. STEVENSON, J. M.D.

# PHYSICO-CHEMICAL METHODS IN SURGERY

## ROENTGENOLOGY

**Bulsson M.** The Combination of Roentgen Therapy and Moist Heat Therapy in Lupus Vulgaris. *Acta Med. Scand.* 1934. 111: 1-10.

It seems to be a well known fact that the treatment of lupus vulgaris by x-ray is superior to the treatment by moist heat. The combination of the two methods is a logical one. The results of the treatment of lupus vulgaris by the combination of the two methods are reported in this paper. The results are very satisfactory. The combination of the two methods is a well known fact. The results of the treatment of lupus vulgaris by the combination of the two methods are reported in this paper. The results are very satisfactory.

In the treatment of lupus vulgaris, the combination of the two methods is a well known fact. The results of the treatment of lupus vulgaris by the combination of the two methods are reported in this paper. The results are very satisfactory. The combination of the two methods is a well known fact. The results of the treatment of lupus vulgaris by the combination of the two methods are reported in this paper. The results are very satisfactory.

**Gillard A.** A Contribution on the Radiotherapy of Seminoma (Continuation of the radiotherapy of the tumor). *Ann. Med. Radiol.* 1934. 1: 1-10.

Gillard traces the development of our present conception of seminoma from the work of Pillet and Coste in 1895 and gives a summary of the controversial views. He reviews briefly the histology, clinical characteristics and sites of metastasis of the tumor, stressing particularly the variability of the neoplasia, the extreme fragility and high glycogen content of the round and polyhedral cells, and the large number of lymphocytes sometimes forming follicles seen in the stroma.

Seventeen cases treated by x-ray irradiation alone or combined with surgery are reported. Of the eleven patients who were treated in the period be-

tween 1922 and 1932 only two are still alive. The two patients treated for ovarian seminoma have survived for ten and three years respectively. Several of the more interesting cases are reported in detail. In discussing the factors involved in cure of the condition the author is inclined to attribute more importance to the age of the patient than to the effects of a strait jacket or the surgical treatment of the tumor, or the surgical treatment of the tumor.

**Albertini A. von.** The Presence of Microcytes in Round Celled Sarcoma as Histological Evidence of the Sensitivity of These Tumors to Irradiation. *Arch. Klin. Chir.* 1934. 16: 1-10.

The author discusses the role that according to modern conceptions histological diagnosis is destined to play in the treatment of malignant tumors. He refers especially to the radiobiological character of certain tumors. He then reports in detail three cases in which the histological picture of specimen excised for biopsy made it possible to foretell the marked radiosensitivity of the tumors. The results in these cases are round celled sarcoma with cells of medium size of the kind characterized histologically by a structure of the tumor cells and especially the presence of scattered and focally accumulated so called microcytes. The latter are a characteristic degenerative form of tumor cells which sometimes have a close morphological resemblance to erythroblasts but as a rule are small cells with a round shaped pyknotic nucleus similar to the well known microcytes in lymphatic tissue. However, the tumors in which they are found are not lympho sarcoma.

The presence of the microcytes described, which is interpreted as an indication of spontaneous degeneration of the neoplasm or a tendency toward such degeneration must be regarded also as an indication of marked radiosensitivity.

**Molesworth, J. H.** X-Ray Necrosis. *Med. J. Aust.* 1934. 10: 1-10.

Molesworth divides x-ray necrosis into the acute type due to a single overdose or a series of exposures the sum of which amounts to an overdose, and late x-ray necrosis.

In acute necrosis there is a rapid progression through the ordinary stage of erythema to vesiculation followed by the separation of a moist, adherent and grayish green slough. The process is accompanied by an acute and persistent burning pain which resists all local applications. If the dose has not been too great, islands of epithelioma may sur-

vive and provide centers from which epithelium may grow to cover the denuded surface when the sloughs finally separate. The length of time during which the ulceration persists varies with the depth of the sloughing process and especially with the area of the surface involved. Healing is slow. The resulting cicatrix is weak and covered with atrophic epithelium. Later telangiectasie appears, and still later flecks of pigment and hyperkeratotic patches develop. Subsequently warty projections may form and after a varying interval give rise to carcinoma. In severe cases the ulcer may never heal and skin grafting may fail so that it may be necessary to excise the whole area deeply and cover it with a tube graft.

Late necrosis may appear from a year to five years after the treatment. It may develop as result of an acute burn which has healed or the too frequent repetition of doses on the same area, perhaps over a period of years without the production of an erythema. Late X-ray necrosis never occurs on an area of apparently normal skin. It always supervenes on an area of chronic radiodermatitis. Its appearance is that of dry dark brown to black gangrenous patches which are shrunken below the main surface and look like stained pig skin. Many months may elapse before these separate and leave ulcers which require many months to heal or will not heal without plastic surgery. The pain is notable, but not to be compared with the pain caused by acute sloughing induced by recent X-ray burn. The ulceration rarely extends further than the depth of the skin. The extent of the surface involved in the ulceration and the chronic radiodermatitis surrounding the ulcer are most important factors in the prognosis. If the area of ulceration is small, the prognosis is good, whereas if the ulcer though shallow is in the center of a large area, the outlook is practically hopeless as regards healing.

The author observed necrosis of skeletal tissue only in a case with an extensive area of chronic dermatitis over the thorax. He states that too frequently repeated deep X-ray therapy for carcinoma of the breast is believed to be the cause. In the case cited three successive series of deep X-ray irradiations were given, each of which provoked definite erythema. At least five to three years ago, eight years after the treatment, the patient remained free

from recurrence, but the whole area showed chronic X-ray dermatitis and in the region of the costal areas a deep late ulcer developed and persisted for months until a portion of costal cartilage was long separated and was removed. The ulcer then slowly healed. The author believes that these effects are undoubtedly related to interference with nutrition probably due to endarteritis and fibrosis and that they will be less frequent when measurement of the dosage is improved and too prolonged and too frequently repeated treatments are no longer given.

A. JACOB LARSEN, M.D.

## MISCELLANEOUS

Paschoud, H.: The Treatment of Suppurative Peritonitis. I. Introduction to the Use of Ultraviolet Light in Operative Surgery. (Traitements des péritonites suppurées. Introduction à l'emploi des ultra-violet en chirurgie opératoire). *Ann. Ch. de la Suisse Rom.* 1934, 54, 770.

The author describes rather briefly Havlicek's method of irradiating a loop of intestine and its mesentery with ultraviolet light in cases of generalised suppurative peritonitis. He reports cases of his own in which such irradiation was followed by an unusually smooth convalescence. In this treatment the peritoneal cavity should not be disturbed by aspiration, sponging or irrigation. The abdomen is closed without drainage. Only local or nitrous-oxide oxygen anaesthesia should be employed. The use of ether renders the method unsatisfactory.

In cases of pneumococcal peritonitis Havlicek removes 1 cm. of the pus by peritoneal puncture, irradiates it with ultraviolet light, and then injects it intramuscularly in repeated doses.

Irradiation of the mesentery with ultraviolet light is supposed to prevent distention of the capillaries in the splanchnic area and thereby prevent the shock and circulatory collapse so often associated with peritonitis. The irradiation has been found to reduce postoperative discomfort and the incidence of post-operative embolism. The author cites Havlicek's report of 23 cases of diffuse peritonitis which are operated upon and irradiated in the manner described in a period of three years with no deaths. The details of the irradiation are not given.

MAX M. ZIVKOWSKI, M.D.

## MISCELLANEOUS

### CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Lascano, J. C., and Valenzuela, J. R. The Clinical Syndrome of Short Neck and a Very Rare Malformation of the Heart in a Newborn Infant (Síndrome clínico de cuello corto y muy rara malformación cardíaca en un recién nacido) *Boletín Soc. de obst. y ginec. de Buenos Aires*, 1934, 13: 155

In the case reported the neck was unusually short, the head sitting deeply between the shoulders, which almost touched the ears. All movements of the neck were possible but limited. Physical examination of the heart was negative. The child died of pneumonia at the age of three months. Postmortem examination of the spine disclosed a third occipital condyle, fusion of the bodies of the third and fourth cervical vertebrae, absence of the posterior arch of the atlas, flattening of the laminae, and nearly complete absence of the intervertebral disks. On examination of the heart only one ventricle was found. This was of large size. The left ventricle was larger than normal. The right ventricle was relatively very small. The aorta and pulmonary artery were represented by a single vessel originating from both ventricles.

WILLIAM R. MEERER, M.D.

Odasso, A. Sacrococcygeal Chordoma (El cordoma sacro-coccigeo) *Arch. ital. di chir.*, 1934, 37: 505

The author reports a case of sacrococcygeal chordoma in a man sixty years of age. In January, 1931, the patient fell, striking the sacrum on the ground. In the autumn of that year he began to have lancinating pains in the sacrum lasting a few seconds and coming on several times during the night. During the day he was free from pain. About the first of August, 1932, he noticed a swelling in the sacral region. Examination disclosed to the right of the midline of the sacrum a tumor the size of an orange which was covered with normal skin. The skin was not adherent to the tumor, but the tumor was adherent to the underlying bone. Roentgen examination did not show any erosion or softening of the bone. No enlarged glands or metastases could be demonstrated. Operation performed under spinal anesthesia was followed by healing by first intention. Nine months later the patient returned with a local recurrence of the tumor.

Histological examination showed the physaliphore cells described by Virchow as characteristic of chordoma. These are large vacuolated cells containing mucin. There were also smaller polygonal or fusiform cells containing glycogen and fat. It is generally agreed that chordomata originate from aberrant rests of the notochord. These embryonic cells are capable of undergoing metaplasia into

various forms of cells. While histological examination does not show any marked signs of malignancy, these tumors should be classified clinically as malignant as they are very apt to recur after operation. The treatment should therefore be early and radical removal. The tumors are of a connective tissue rather than epithelial type. They generally develop in the fifth or sixth decade of life. In many cases there is a history of trauma.

The article has an extensive bibliography.

AUDREY GOSS MORGAN, M.D.

Weddell, A. G., and Gale, H. E. D. Changes in the Blood-Sugar Level Associated with Surgical Operations. *Brit. J. Surg.*, 1934, 22: 80

Ingested carbohydrates are absorbed from the intestine in the form of glucose and stored in the liver as glycogen. As required, glycogen is reconverted into glucose and passed into the blood stream to maintain the blood-sugar level at from 80 to 120 mgm per cent. The cycle is influenced by nervous-hormonic factors. The sympathetic-adrenalin mechanism promotes the change of glycogen into sugar, while the vagal insulin mechanism promotes the conversion of sugar into glycogen.

In a study of the blood-sugar levels in nine patients during various phases of major surgical procedures the authors found that half an hour before the operation there was no appreciable rise in the blood sugar, although it is well known that patients in a state of anxiety or apprehension have hyperglycemia (sympathetic-adrenalin factor). They therefore conclude that their patients were not unduly apprehensive.

The induction of surgical anesthesia with nitrous oxide, oxygen, and ether produced an increase in the blood sugar level averaging from 20 to 50 mgm per cent (sympathetic adrenalin factor). However, the duration of the anesthesia did not determine the height of the maximum rise.

Operations near the splanchnic area (solar plexus) caused a greater rise in the blood-sugar level than operations at a distance from that area. The duration of the operation was found to be relatively unimportant in determining the height of the rise in the blood sugar curve.

Patients who appeared comfortable and relatively free from pain (vagal insulin factor) after operation had lower blood sugar levels than those that were uncomfortable or in pain (sympathetic adrenalin factor).

Rectal drips of glucose and saline solution had no specific effect on the blood-sugar level. On theoretical grounds this is correct because the rate of absorption from the rectum is quite slow (6 gm per hour). However, rectal drips of glucose may be of some

value as convenient means of feeding the patient after operation.

The authors are inclined to believe that persistently high postoperative blood sugar level is to be expected when the patient is not doing well.

LATANA S. W. TUCKER, M.D.

### DUCTLESS GLANDS

Fenster, E. A Case of Extragenital Chorioepithelioma in a Male with Proliferative Anterior Pituitary Lobe Reaction (Lieberkin extragenitale Chorioepithelioma beim Mann mit proliferativer Hypophysenhinterlappenreaktion). *F. Monat. Zeitsch. f. Path.* 93: 45, 1931.

Fenster reports a case of extragenital chorioepithelioma in a male which apparently had its origin in a retroperitoneal teratoma. When the testicles were examined in serial sections no macroscopic nor microscopic pathological changes were found. The tumor and its metastases behaved biologically like chorioepithelioma in the female or testicular chorioepithelioma. The anterior pituitary lobe tests made with material from the tumor and metastases were positive sometimes markedly positive.

In spite of the numerous metastases and the completely intact testicles, no gynecomastia was observed. Therefore the theories of Mendrich, Fels, and Mathias that intact testicles do not hinder the development of colostrum formation and that the quantitative formation of colostrum is dependent upon the amount of tumor tissue are not supported.

The theory of Prym that conclusions regarding the testicular or extragenital origin of a chorioepithelioma can be drawn from the localization of the metastases is not accepted by the author as in his case of definitely extragenital chorioepithelioma the local involvement was the same as in cases of testicular chorioepithelioma.

H. O. NICHOLS, LONDON, ENGLAND

### SURGICAL PATHOLOGY AND DIAGNOSIS

Cutler, C. W. J. Errors of Surgical Diagnosis. A Study of the Records of the First Surgical Division of the Roosevelt Hospital Covering Period of Three Years. *Am. J. Surg.* 44, 1931.

The author analyzed errors in surgical diagnosis made in period of three years. His purpose was to determine what errors are made most frequently, why they are made and how they may best be avoided.

**Acute appendicitis.** Of 150 cases in which diagnosis of acute appendicitis was made the diagnosis was incorrect in 5 (3 per cent). Of the latter the symptoms were due to acute salpingitis in 3, chronic appendicitis in 1, enteritis in 1, typhilitis in 1, pneumonia in pelvic disease other than salpingitis in 1, acute cholecystitis in 1 and miscellaneous conditions in 1.

In discussing the cases in which acute salpingitis was diagnosed as acute appendicitis, Cutler states that the differential diagnosis between these conditions is sometimes difficult and because of the hazards of acute appendicitis the patient must be given the benefit of the doubt.

In most of the cases in which the symptoms were found by the pathologist to be due to chronic instead of acute appendicitis, the appendicitis was of the obstructed type with acute colic but without acute inflammation. In several of them there had been previous attacks.

In the 4 cases of enteritis the removed appendix was found normal. Three of the patients with enteritis were children. Cutler calls attention to the fact that the seriousness of appendicitis in children requires special caution, and that in cases in which the classical symptoms of acute appendicitis are lacking fulminating appendicular disease may be discovered at operation.

Of the patients with typhilitis diagnosed as acute appendicitis, 8 were children with serous peritonitis and enlarged mesenteric glands.

Cutler states that in pneumonia, X-ray examination has greatly reduced the incidence of diagnostic error.

Because of the frequency of pelvic conditions other than salpingitis, such as hematometra, intussusception of the pedicle of an ovarian cyst and rupture of chocolate cyst of the ovary no female should be operated upon for acute appendicitis without first being subjected to a vaginal or rectal examination.

In the reviewed cases of acute cholecystitis diagnosed as acute appendicitis, a low position of the gall bladder as responsible for the error.

**Chronic appendicitis.** Of 3 cases in which a diagnosis of chronic appendicitis was made the diagnosis was erroneous in 2 (66 per cent). In 3 of the 3 cases with an incorrect diagnosis the symptoms were due to pelvic disease although the findings of vaginal examination were reported normal. Cutler says that in the future the diagnosis must be based on more accurate palpation supplemented by hipshot injection and X-ray examination. In 1 of the cases reviewed, chronic cholecystitis was not diagnosed, and in another appendicitis because as found. Cutler believes that the diagnosis of chronic appendicitis will be made less frequently as methods of examining the biliary system, stomach, kidneys, ureters, and pelvic organs are improved.

**Hernia.** Of 20 cases in which diagnosis of hernia was made, the diagnosis was incorrect in 5 (25 per cent). In 3 cases operated upon for inguinal hernia, enlarged ring but no sac was found. One supposed inguinal hernia, the hydrocele proved to be only hydrocele. In 2 cases of supposed incarcerated inguinal hernia there was hydrocele of the cord, and in 1 case the condition proved to be a femoral hernia. One strangled hernia was found to be inguinal instead of femoral. In 4 cases of femoral hernia the diagnosis was respectively femoral adenitis, inguinal adenitis, femoral aneurysm.

## MISCELLANEOUS

and psoas abscess. One supposedly strangulated umbilical hernia was not strangulated, and in incarcerated inguinal hernia was mistaken for varicocele. These mistakes emphasize the importance of eliminating the various conditions which may simulate hernia, and particularly of scrutinizing hernia which do not reduce. To guard against negative findings at operation the patient should be made to demonstrate his hernia before repair is undertaken. In enlarged inguinal ring and pain in the groin are not satisfactory criteria of the necessity for repair.

*Acute cholecystitis.* Of 6 cases in which a diagnosis of acute cholecystitis was made, it was incorrect in 1. In the latter, the condition was acute inflammation of a high lying appendix.

*Chronic cholecystitis.* Of 101 cases in which a diagnosis of chronic cholecystitis was made, the diagnosis was incorrect in 13 (6.05 per cent). In 2 of the latter no lesions were found. In another there was a marked gastroenteroptosis. In 1 case the condition was an acute suppurative cholecystitis running a quiet course. In 2 cases, operation revealed a duodenal ulcer and in 1 case each, chronic pancreatitis, chronic appendicitis and tuberculous gall bladder, pelvic peritonitis and retroperitoneal lymph nodes impinging on the common duct. In 2 cases the symptoms were due to firm bands of adhesions running across the duodenum. The mistakes in this group of cases emphasize the importance of making a thorough X-ray examination of the gastrointestinal tract when gall bladder disease is suspected.

*Calculus in the common duct.* Of 13 cases in which a diagnosis of calculus in the common duct was made, it was incorrect in 3 (23 per cent). In 1 of the latter the condition was acute yellow atrophy run-

ning a fairly prolonged course, and in 2, the symptoms were due to a stricture of the duct following a previous operation.

*Duodenal ulcer.* Of 64 cases in which a diagnosis of duodenal ulcer was made, it was wrong in 8 (12.5 per cent). In 1 of the cases with an erroneous diagnosis the stomach and duodenum were normal. In the 7 others the postoperative diagnosis was chronic appendicitis. Cutler states that as patients presenting the symptoms of duodenal ulcer are now being thoroughly examined with the roentgen ray and then subjected to medical treatment over and over again unless obstruction occurs, fewer of them are being operated upon and fewer errors are being made.

*Acutely perforated duodenal ulcer.* Of 10 cases with a diagnosis of acutely perforated duodenal ulcer, the diagnosis was incorrect in 6 (31.5 per cent). The direct consequences of leaving a perforated ulcer without operation perhaps accounts for the high percentage of error in this group. In 3 cases the condition proved to be acute cholecystitis with stone, in 1 case, a volvulus of the intestine with gangrene, in 1 case, a perforated carcinoma of the sigmoid, and in 1 case, a pyloric or coronary occlusion. Therefore operation was warranted in 5 of the cases in which the diagnosis was wrong. The X-ray is of great aid in the necessarily hurried diagnosis as a subdiaphragmatic gas bubble is practically pathognomonic of perforation.

There were 70 errors of diagnosis in miscellaneous conditions.

The total number of cases operated upon was 2,340, the total number of diagnostic errors, 110, and the percentage of error in the total number of cases 4.6.

MATTHEW MINTES, M.D.

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NOTE—THE BOLD FACE FIGURES IN BRACKETS AT THE RIGHT OF A REFERENCE INDICATE THE PAGE OF THIS ISSUE ON WHICH AN ABSTRACT OF THE ARTICLE REFERRED TO MAY BE FOUND.

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ability to cure A HIRVITZ 58 Tag d deutsch Ges f  
Chir Berlin, 934 [14]
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1934, 48 39
- Osteopetrosis due to stress and hypotrophy of the mand-  
ible P ROSEY *Am J Dis Child* 934, 48 243
- The recognition of maxillary fractures K H LARK *Arch*  
Ibnd Chir 934, 79 64
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M J 934, 52
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Berlin, 934

### Eye

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spontaneous statements of the patient H G A GYR  
and Arch Ophthalm 934, 120
- Ophthalmoplegia associated with bony changes in the  
region of the sphenoidal fissure B V TAYL *Brit J*  
*Ophthalm* 934, 8 53
- The targetometer new portable instrument for  
charting tangent screens at various distances H A  
WATKINS *Arch Ophthalm* 934, 107
- A tangent screen with artificial daylight illumination  
C BILSON, D KIRK, and B F F TAYL *Am J Ophthalm*  
934, 7 326
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# International Abstract of Surgery

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## CONTENTS

I	Authors of Articles Abstracted	11
II	Index of Abstracts of Current Literature	III-VII
III	Abstracts of Current Literature	89-168
IV	Bibliography of Current Literature	169-192

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## AUTHORS OF ARTICLES ABSTRACTED

- Ueberhaus, B. S. 20  
 Uekens, L. 4  
 Ueberhaus, L. 141  
 Adams, A. W. 9 92  
 Aitken, R. S. 167  
 Allen, E. V. 160  
 Alvarado, H. 33  
 Aldrich, W. DeW. 160  
 Anspach, B. M. 20  
 Anshelm, S. 118  
 Adee, H. B. 116  
 Babalatz, L. 143  
 Balfour, D. C.  
 Bancroft, F. W. 14  
 Bando, N.  
 Barnard, W. G. 144  
 Becker, S. W. 163  
 Beis, H. 48  
 Benedict, W. L. 9  
 Bengtson, A. J. 16  
 Bennett, T. J. 8  
 Bilelock, A. 39  
 Bohannon, O. 11  
 Borchardt, M. 92  
 Bosworth, D. M. 41  
 Boyke, P. E. 94  
 Bowne, E. J. 140  
 Bradshaw, H. 4  
 Bratton, A. B. 67  
 Bre, E. A. 18  
 Brocher, J. E. W. 6  
 Brooks, B. 80  
 Brown, C. J. O. 14  
 Broyles, E. V. 103  
 Brumckhaus, A. 46  
 Burbury, W. M. 144  
 Caffery, P. 10  
 Cahill, W. L. 9  
 Calif, C. 3  
 Clark, C. 11  
 Carlson, H. A. 143  
 Casey, A. E. 61  
 Castroviejo, R. 9  
 Cui, J. M. 80  
 Cahoon, 156  
 Costa, O.  
 Creelman, M. 1  
 Cresswell, R. E. 4  
 Cretter, B. C. 60  
 Cretting, R. A. 30  
 Davis, L. 66  
 Debat, R. 107  
 Dechastre, M. 80  
 Decker, J. 141  
 Demetrius, J. 98  
 Desjardins, A. U. 46  
 D'Esope, D. A. 110  
 Di Paola, L. 80  
 Dimick, T. 3  
 Dixon, O. J. 143  
 Donati, D. 36  
 Doroshov, G. D. 33  
 Doucang, J. 8  
 Dwyer, J. 91  
 Eckerson, E. B. 105  
 Egerton, A. A. 90  
 Elliott, A. R. 14  
 Elmow, E. T. 67  
 Faustina, S.  
 Farrell, J. T. J. 9  
 Fenton, F. G. 91  
 Fenlon, R. A. 93  
 Ferguson, A. R. 38  
 Field, A. B. 107  
 Felt, P. A. 95  
 Foster, J. M. J. 66  
 Fox, S. L. 106  
 Gairard, G.  
 Garm, C. J. 17  
 Geschickter, C. I. 104  
 Giarlano, L. 20  
 Gilbert, R. 43  
 Gilman, E. 97  
 Gilmour, A.  
 Goncalves da Costa, S. F. 64  
 Grasso, R. 67  
 Gray, A. A. 91  
 Gray, H. K.  
 Greer, G. W. 34  
 Gross, R. E.  
 Gross, S. W. 100  
 Hakkio, K. O. 4  
 Hall, C. 94  
 Hays, H. J. 66  
 Harlow, M. 38  
 Hartman, C. G. 101  
 Hecker, P. S. 13  
 Heermann, L. G. 144  
 Hewer, G. J. 100  
 Hoffman, J. 20  
 Hope Robertson, W. J. 92  
 Howarth, M. B. 38  
 Jacob, W. 68  
 Jarr, H. A. 161  
 Jenkins, E. L. 54  
 Jacques Corvantes-Fraico, J. 96  
 Jones, S. S. 145  
 Kandel, E. 146  
 Kepler, E. J. 30  
 Kirkin, B. R. 10  
 Kirkman, L. J.  
 Klatten, E. 0  
 Kooch, A. 140  
 Krabbe, K. H. 91  
 Krack, R. R. 161  
 Krasak, R.  
 Ladd, W. E.  
 Lee, H. 5  
 Le-Roy, C. M. 17  
 Lewis, D. 101  
 Lewis, E. 140  
 Lilia, W. I. 93  
 Livingston, H. 50  
 Louch, W. 93  
 Lork, J. M. 97  
 Lowry, J. 118  
 Luzzo, R. 5  
 Lord, C. C. 94  
 Lytle, T. K. 93  
 MacKenna, D. W. 33  
 Madras, G. 24  
 Manno, H. 107  
 Marcell, A. 14  
 McGraw, W. H. 38  
 McBride, J. 6  
 Michon, P. 8  
 Mikelsen, G. 6  
 Moley, H. C. 10  
 Monod, R. 101  
 Montgomery, J. B. 19  
 Moninger, M. 98  
 Moninger, L. 11  
 Neuwinger, C. H. 31  
 Neuwinger, W. 14  
 Overcross, H. 100  
 Oliver, H. 6  
 Overholt, R. H. 101  
 Osipov, D.  
 Pardo, G.  
 Patman, G. 6  
 Peterson, L.  
 Petrie, G. 101  
 Phemister, D. B. 39  
 Phelps, G. 90  
 Pignatelli, H. 37  
 Perritt, A. E. 154  
 Piry, D. 106  
 Price, L. W. 146  
 Quirk, F. H. 93  
 Ratner, M. 11  
 Reid, M. R. 144  
 Reichert, F. J. 101  
 Roberts, S. K. 161  
 Robertson, H. E. 143  
 Ross, A. 11  
 Roach, O. 141  
 Roemer, J. 148  
 Roemer, G. 91  
 Rinehart, D. 107  
 Salinas, A. S. 101  
 Sauer, S. 131  
 Smith, E. 4  
 Schmidt, E. R. 131  
 Schaefer, M. T. 96  
 Schuman, W. 100  
 Scott, R. K. 11  
 Selinger, G. 11  
 Seng, E. 97  
 Seligson, T. 131  
 Shuman, G. 43  
 Smith, A. J. D. 31  
 Sodano, A. 10  
 Sonntag, E. J.  
 Soto-Hall, R. 141  
 Staley, R. W. 3  
 Starke, I. 11  
 Steiner, C. V. 16  
 Tread, M. S. 146  
 Thygeson, P. 90  
 Trause, R. O. 15, 16  
 Uhle, C. A. W. 11  
 Vance, B. M. 44  
 Veronesi, A. J.  
 Vercel, A. 11  
 Veron, J. 7  
 Walters, W. 30  
 Walker, O. 111  
 Waters, R. M. 11  
 Wilder, R. M. 30  
 Williams, W. R. 1  
 Wille, J. M. 107  
 Willemsen, J. 30  
 Wright, R. D. 17

# CONTENTS—FEBRUARY, 1935

## ABSTRACTS OF CURRENT LITERATURE

### SURGERY OF THE HEAD AND NECK

#### Head

- Cut, J. M. Epidermoidal Glioma of the Scalp 53  
 Diehauf, M. Localized Hypertrophic Osteitis of the Maxilla Pathogenesis 53  
 Di Nataro, L. Intraglandular Calculosis of the Submaxillary Gland 53

#### Eye

- Duvernoy, P. The Nature of the Elementary and Initial Bodies of Trichoma 60  
 Anso, A. W., and Bennett, W. I. Hemangioma Endothelium of the Orbit Removal Through a Transcranial Approach 60  
 Castroviejo, R. Keratoplasty 60  
 Hoff Pomeroy, W. J. Hemangioblastomatous Cysts of the Retina 60  
 Ellis, W. I. and Anso, A. W. Unilateral Central and Annular Scotoma Produced by Callus from a Fracture Extending into the Optic Canal Report of Two Cases 60  
 Fair, T. K. and Fenton, I. G. The Advantages of Intravenous (Euphan) Anesthesia in Ophthalmic Surgery 60

#### Ear

- Graw, A. A. The Otosclerosis Problem Including Reports of Two Cases Examined Pathologically 60

#### Mouth

- Duvernoy, P. The Saliva 60  
 Leitch, C. C. A Comparison of the Apparent End Results in Cases of Carcinoma of the Mouth in Relation to the Length of the Follow Up 60  
 Boyd, P. F. Intracranial Extension of a Dental Granuloma 60

#### Pharynx

- Hall, C. The Laryngological Section of the American Laryngological Society 60

- Loff, J. M. Stopping of the Vocal Cords 97  
 Newmiller, W. The Content of Thyroid Gland Hormone in the Blood During Pregnancy 114

### SURGERY OF THE NERVOUS SYSTEM

#### Brain and Its Coverings, Cranial Nerves

- Powers, G. and Meringer, M. A Study of the Intermediary Lobe of the Hypophysis 97  
 Loefer, W. and Jacob, W. The Importance of the Intracranial Pressure in the Circulatory Conditions of the Brain in Arteriographic Visualization 97  
 Phillips, G. Radiography in the Diagnosis of Intracranial Tumors 97  
 Gross, S. W. Tumors of the Brain in Infancy Clinical and Pathological Study 100  
 Fogarty, A. A. Pathways of Infection in Suppurative Meningitis 100  
 Oliviero, A. B. Parasagittal Meningioma 100  
 Krabber, K. H. Facial and Meningeal Anomalies Associated with Calculations of the Brain Cortex A Clinical and Anatomopathological Contribution 101  
 Fitch, P. A. Diagnostic Factors Concerning Herpes Zoster Oculi 101  
 Pridis, G. The Problem of Severe Cerebral Symptoms After Operations on the Pleura or Lung 101  
 Davy, J. The Relation of the Hypophysis Hypophyseal and the Autonomic Nervous System to Cardio-vascular Metabolism 101  
 Ellison, I. T. and Wolcott, J. M. The Effect of Castration on the Anterior Hypophysis of the Female Rat 101  
 Mittle, J. S. and Ellis, J. D. A Case of Symptomatic Syphilis 101  
 Benson, A. B. and Ellison, A. B. A Case of Syphilis of the Brain 101

#### Spinal Cord and Its Coverings

- Bennett, W. I. Syphilis of the Spinal Cord 101  
 Salmon, A. S. C. Syphilis of the Spinal Cord 101

- OVERHOLT, R. H., and ECKHART, L. B. The Treatment of Cancer of the Breast and the Results of Operation  
FOX, S. L. Sarcoma of the Breast.

## Trachea, Lungs, and Pleura

- FORTY, J. M. JR., and PARY, D. The Treatment of Acute Traumatic Hemothorax  
HARA, H. J. Organic Foreign Bodies in the Bronchi The Reaction of Lung Tissues in Rabbits  
SEIDERT, E. and MAROW, H. Cases of Pulmonary and Tubercular Mycoses  
DEBET, R. and GILBERT, E. Gas Cysts of the Lung and Bronchioles  
RICHMOND, F. J. and RAYLEY, E. N. The Surgical Treatment of Carcinoma of the Bronchi and Lungs  
MAROW, R. and DIMICKLEAU, J. Single-Stage Lobectomy with Open Pleura  
PATRICK, G. The Problems of Severe Cerebral Symptoms After Operations on the Pleura or Lung

## Heart and Pericardium

- CUTLER, E. C. and SCHREIBER, M. T. Total Thyroidectomy for Angina Pectoris.

## SURGERY OF THE ABDOMEN

## Abdominal Wall and Peritoneum

- PACFARI, D. A Case of Multiple Ventral Hernia—Spargel's Hernia—with Concentric Stringulated Umbilical Hernia  
BARRERO, N. Occult Epigastric Hernia

## Gastro-Intestinal Tract

- GR. V. H. K. BALFOUR, D. C. and KINKLY, B. R. Cancer of the Stomach  
BORGARSON, G. On the Technique of Partial Gastrectomy (Billroth I)  
COSTA, G. Late Intestinal Strangula Secondary to Hemal Incarcerations  
IADU, W. E. and GROSS, R. E. Intussusception in Infancy and in Childhood A Report of 375 Cases  
FRIEDSON, I. Adhesion of the Terminal Ileum and Ileus of the Adherent Terminal Ileum An Anatomical, Clinical, and Clinicostatistical Study  
DYWERT, T. The Origins and Evolution of Colicotomy  
BRANDMAN, H. Appendicitis and Acute Infectious Abdominal Conditions in Scarlet Fever A Report of Nine Cases and Review of the Literature  
BROWN, C. J. O. Deaths from Appendicitis  
VANDERLINDEN, L. Sixty One Cases of Volvulus of the Sigmoid, and Observations on Their Surgical Treatment  
LEE, H. and STALEY, R. W. Inflammatory Structures of the Rectum and Their Relation to Lymphogranuloma Sigmoidale

- ROBERT, J. Acute Postoperative Dilatation of the Stomach Complicated by Perforation  
EILBERT, A. R. and JACKSON, E. L. Ulcerations of the Stomach and Small Intestine Following Roentgen Therapy: Report of a Fatal Case with Perforation

- CUTTING, R. A. The Absorption of Dextran and Water by the Small Intestine and the Colon An Experimental Study

## Liver, Gall Bladder, Pancreas, and Spleen

- LOHMEYER, R. Is There Functional Specificity of Certain Regions of the Liver?  
RICHOLDS, A. J. and SCHULTZ, C. V. The Provoked Examination of Gall Stones  
MILLER, O. Acute Pancreatitis I. Severe Cases, with Special Regard to Their Conservative Treatment

## GYNECOLOGY

## Uterus

- DEUTER, J. The Treatment of Fibromata of the Uterus in the Absence of Pregnancy

## Adnexa and Peritoneal Conditions

- ASCHERSON, S. The Action of Gonadotropic Substances on the Ovary  
MONTGOMERY, J. B. and FARRELL, J. T. JR. The Value of Postoperative Roentgen Irradiation in Carcinoma of the Ovary

## Miscellaneous

- KLAFFEN, E. Cystodysplasia A New and Simple Method of Abolition.  
CANNON, W. E., MOORE, H. C., and D'EMERY, D. A Report of Further Studies on the Architecture of the Fallopian  
GILKINSON, E. Remarks and Considerations on Hypophyseal and Ovarian Hormones in the Menstrual Blood  
AMERSON, B. M. and HOFFMAN, J. Endometrial Findings in Functional Disorders of Menstruation  
KLEINER, R., KIDDERMAN, I. J., and CROOKMAN, M. Studies Relating to the Time of Human Ovulation  
FARRELL, J. T. JR. The Problems of the Fertility of the Female Internal Genital Organs and the Question of Pain Associated with Gynecological Diseases and Labor  
STURLA, I. The Endothelial Saga in Obstetrics and Gynecology  
WILLIAMS, W. R. Heterotopic Teeth and Their Significance, with Special Reference to the Intra-Abdominal Group  
GILKINSON, A. and FARRELL, J. T. JR. The Temperature and Vascular Reactions in the Treatment of Inflammatory Diseases of the Female Genitals by Heat Procedures  
WALTERS, O. Lymphosarcomatous of the Female Genital Organs

## OBSTETRICS

## Pregnancy and Its Complications

- NEUWEHL W. The Content of Thyroid Gland Hormone in the Blood During Pregnancy 121
- MADRYA G. The Work of the Urinary Bladder in Pregnancy 124
- TRAIKIAO G. Abnormal Conditions of Pregnancy and the Sugar Content of the blood of the Mother and Child 125
- GAPPAS C. Maculogenous and Lymphatic Leukemias and Melanomas Associated with Pregnancy 126
- ATLER H B. Pernicious Vomiting of Pregnancy 126
- CARTER P. Death from Eclampsia 126
- TRAIKIAO G. The Neurovegetative State in Preeclampsia of Pregnancy 126

## Labor and Its Complications

- VORON J. and LECHE H. Managed Labor. The Energy and Innocuity of Certain Procedures Interdicted to Direct the Course of Labor 127
- GRACE C J. The Conduct of Labor in Cases of Placenta Previa with Special Reference to the Scap Torques 127

## Puerperium and Its Complications

- MUNO P. and LOUVOY J. Two Cases of Severe Puerperal Anemia 128

## Miscellaneous

- SODANO A. The Reaction of the Blood to Gutta serena in Olfactics 128
- SCHEMA W. A New Measurement (Clinical) for Estimating the Depth of the True Pelvis 129

## GEMTO-URINARY SURGERY

## Adrenal, Kidney, and Ureter

- TRAIKIAO G. The Neurovegetative State in Preeclampsia of Pregnancy 126
- WALTERS W. WILDF, R. M. and KILLER I. J. The Suprarenal Cortical Syndrome with the Presentation of Ten Cases 130
- ABESHOSE B. S. Pyelographic Injection of the Perirenal Lymphatics 130
- CALEP C. Chromocystocopy with Phenolsulphonphthalein in the Diagnosis of Kidney Function 131
- VERMOOTEN A. and NIELSEN G. P. The Effects, on the Upper Urinary Tract in Dogs of an Incompetent Uretero-vesical Valve 131
- UTILE, C. A. W. Gonococcal Pyonephrosis: Report of a Case with a Review of the Literature. 131
- KOMANI, A. A Contribution to the Study of Stenoses of the Ureter 132
- JARRE, H. A. and CUMMING, R. F. Pyelopenistalsis Characteristically Altered by Infection, with Notes on the Functional Behavior of Other Hol low Viscera 162

## Bladder, Urethra, and Penis

- SANF S. and DOBOSHOW G. D. Cystitis Implex seminata. I. In an Elderly Diabetic Woman 131
- II. In a Three Months Old Female Infant 131
- SUTRI, A. J. D. The Use of Radium in Carcinoma of the Bladder 132
- SEIVACCI, C. Cancer of the Urethra in the Male 132
- ARCTI, A. and METTER, H. A Case of Malignant Non Carcinomatous Tumor Primary in the Corpora Cavernosa of the Penis with Visceral and Osseous Metastases 133

## Genital Organs

- CAPLI, C. Torsion of the Spermatic Cord 133
- SJOSTRAND I. Acute Tuberculous Epididymitis and Epididymo Orchitis 134
- MARSLIA A. Aberrant Adrenal Tissue in the Epididymus 134
- MOZKOWICZ, L. The Origin of Cryptorchidism 135
- MACKENZIE, D. W. and RAYNER, M. Malignant Growth in the Undescended Testis. A Review of the Literature and a Report of Two Cases 135
- DONATI, D. Fibrosarcoma of the Tunica Vaginalis of the Testicle, a Clinical and Pathological Study 136

## Miscellaneous

- WOLFE, S. C. and COLSO. The Search for Koch's Bacilli in the Urine 136
- LE ROY, C. M. Colon Bacillus Hematuria 137

## SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

## Conditions of the Bones, Joints, Muscles, Tendons, Etc

- McGAW, W. H. and HARPER, M. The Role of Bone Marrow and Endosteum in Bone Regeneration. An Experimental Study of Bone Marrow and Endosteal Transplants 138
- BRAY, I. A. and HITCH, P. S. Tuberculous Rheumatism. A Review 138
- IRFELSON, A. B. and HOWORTH, M. B. Coxa Plana and Related Conditions at the Hip. I. Classification and Correlation of These Conditions. II. A Study of Seventy Five Cases of Coxa Plana 138
- BYOCHER, J. I. W. The States of Inhibition of the Bone Marrow 161
- PATRASSI, G. Changes in the Cell Picture in the Bone Marrow in Infectious Diseases and the Origin of the Toxic Granulations in the Neutrophile Cells in the Circulation 161

## Surgery of the Bones, Joints, Muscles, Tendons, Etc

- BOZSAN, F. J. A New Attempt at Treatment of Chronic Osteomyelitis 140
- DELCHER, J. and ROUDIL, G. The Treatment of Spastic Paralysis 141
- BOSWORTH, D. M. Autogenous Bone Pegging for Epiphysitis of the Tibial Tubercle 141
- ADAMESTEANU, C. The Static Conditions of the Foot After Astragalectomy 141

**Fractures and Dislocations**

BANGORY, F. W. The General Question of the Emergency Treatment of Fractures.

145

5 VET, L. Fractures of the Upper Extremity and Shaft of the Humerus in Childhood.

43

SOTO HALL, R. and HALDEMAN, K. O. The Treatment of Fractures of the Carpal Scaphoid.

143

**SURGERY OF BLOOD AND LYMPH SYSTEMS****Blood Vessels**

DEROY, O. J. Experimental Stenosis in Vascular Repair.

143

GILBERT, R. and BASILIANTE, L. Roentgen-Ray Therapy of Vasomotor Disturbances of the Extremities.

143

CARSON, H. A. Obstruction of the Superior Vena Cava: An Experimental Study.

143

HEERMAN, L. G. and REIN, M. R. The Concern in Treatment of Arteriovenous Peripheral Vascular Diseases.

144

BURKARD, W. G. and BURTON, H. M. Gangrene of the Fingers and Toes in a Case of Polyarteritis Nodosa.

144

5 VET, B. M. Thrombosis of the Veins of the Lower Extremity and Pulmonary Embolism as Complication of Trauma.

144

**Blood; Transfusion**

NEUBERGER, W. The Content of Thyroid Gland Hormones in the Blood During Pregnancy.

14

TEJERA RAO, U. Abnormal Coagulability of Pregnancy and the Sugar Content of the Blood of the Mother and Child.

58

MICROW, P. and LOCHT, J. Two Cases of Severe Postpartal Anemia.

8

SOMATO, A. The Reaction of the Blood to Oxydophorin in Obstetrics.

143

JOUR, S. S. and SCOTCHDOPO, G. The Problem of Cadaver Blood Transfusion.

143

ROBERTS, B. R. and KRAEDEL, R. R. Further Studies on Gravidoplasia, with Report of Two Cases.

6

**Lymph Glands and Lymphatic Vessels**

TEJERA, M. S. Experimental Studies of the Healing of Wounds, New Growth, and Autoplastic Transplants of Lymph Nodes.

145

DEJANET, A. U. The Etiology of Lymphoblastomas.

145

DEJANET, A. and LANDAU, E. A Correlation of the Histological Changes and Clinical Symptoms in Irradiated Hodgkin Disease and Lymphoblastic Lymph Nodes.

145

ROMENOV, H. E. Pulmonary Embolism Following Surgical Operations.

145

ROBERT, J. Acute Postoperative Distention of the Stomach Complicated by Perforation.

145

Antiseptic Surgery; Treatment of Wounds and Infections.

14

KOMODA, A. Experimental Results with regard to the Treatment of Infected Wounds.

144

LESTER, E. The Treatment of Pyogenic Infection and Its Sequelae.

145

**Anesthesia**

LEWIS, T. K. and FAYTON, F. D. The Advantages of Intravenous (E spinal) Anesthesia in Ophthalmic Surgery.

143

WHEEL, R. M. and SCHMIDT, E. R. Cyclopropane Anesthesia.

143

SCHWARTZ, E. Therapeutic Dangers and Isoperic Dangers and Isoperic from Local Anesthesia.

143

Therapeutic Dangers and Isoperic from Local Anesthesia.

143

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143

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143

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143

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143

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143

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143

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143

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143

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143

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143

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143

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143

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143

Therapeutic Dangers and Isoperic from Local Anesthesia.

143

Therapeutic Dangers and Isoperic from Local Anesthesia.

143

Therapeutic Dangers and Isoperic from Local Anesthesia.

143

**SURGICAL TECHNIQUE**

Operative Surgery and Technique Postoperative Treatment.

REIL, H. Statistics on Thrombosis During Period of Twenty Years.

43

**MISCELLANEOUS**

Clinical Entities—General Physiological Conditions.

CUTLER, R. A. The Absorption of Dextrose and Water by the Small Intestine and the Colon: An Experimental Study.

143

PERKINS, D. B. and LIVINGSTON, H. Primary Shock.

143

## INTERNATIONAL ABSTRACT OF SURGERY

- BROOKS, B. and BRALOW, A. Shock with Particular Reference to That Due to Hemorrhage and Trauma to Muscles 150
- HUFF, G. J. and ANDRES, W. DrW. The Effect of Adrenal Cortical Extract in Controlling Shock Following the Injection of Aqueous Extracts of Closed Intestinal Loops 160
- ALLEN, J. A. Lymphoedema of the Extremities Classification, Etiology and Differential Diagnosis. A Study of 100 Cases 160
- WHEELER, J. and OLIVIER, H. Surgical Treatment of Arterial Hypertension 161
- BROCHER, J. E. W. The Sites of Inhibition of the Bone Marrow 161
- PATLASSI, G. Changes in the Cell Picture in the Bone Marrow in Infectious Diseases and the Origin of the Toxic Granulations in the Neutrophile Cells in the Circulation 161
- JARRE, H. A. and CLARYS, R. F. Peristalsis Characteristically Altered by Infection, with Notes on the Functional Behavior of Other Hollow Viscera 162
- BENNETT, T. I. Crohn's Disease 162
- ROBERTS, S. R. and KRAUER, F. K. Further Studies on Graciloparasia with a Report of Twelve Cases 162
- BIGGIE, S. W. Melanotic Nevi of the Skin 163
- GOMES DE COSTA, S. I. The Action on Certain Fermentative Processes in Tumor Tissue of Substances That Cause Hypoglycemia 164
- CASRY, A. I. The Experimental Alteration of Malignancy with a Homologous Mammalian Tumor Material I. Results with Intratesticular Inoculation 165
- CASRY, A. I. The Experimental Alteration of Malignancy with a Homologous Mammalian Tumor Material II. Intracutaneous Inoculation of Preserved Material 165
- PRICE, I. W. Metastasis in Squamous Carcinoma 166
- Ductless Glands
- DAVIS, I. The Relation of the Hypophyseal Hypothalamus, and the Autonomic Nervous System in Carbohydrate Metabolism 166
- ELLISON, I. T. and WATERS, J. M. The Effect of Castration on the Anterior Hypophysis of the Female Rat 167
- WITKIN, K. S. and KESSLER, D. A Case of Simmonds' Syndrome 167
- BRATTON, A. B. and HILL, A. B. A Case of Simmonds' Disease 167
- GRISIO, R. The Possibilities of Local Injury to the Tissues from Injections of Adrenalin and Adrenalinized Solutions 167



# INTERNATIONAL ABSTRACT OF SURGERY

FEBRUARY, 1935

## ABSTRACTS OF CURRENT LITERATURE SURGERY OF THE HEAD AND NECK

### HEAD

Cid, J. M. An Epidermoidal Cystoma of the Scalp.  
*Gazzetta medica italiana (Chir. 1934 4: 114)*

The author reports a case of tumor located between the scalp and cranium. The histologic diagnosis pointed many differences in the structure of the tumor, resembling that of several other teratodermas, such as the chondroma, meningelblastoma, neuroepithelioma, and teratomoma. On the basis of its morphological characteristics it could be grouped with the neuroectodermic tumor, but the source of the latter to which it belonged could not be determined.

The diagnosis is called by Cid an epidermoidal glioma, to indicate that it was an atypical schwannoma with cells that had an epithelial form and an epidermoid arrangement. The evolution of the tumor cells seemed to be directed toward neuroblast formation, a fact suggesting a close relationship between the cells of Schwann and the epithelioid or Langerhans cells of neuroblastoma. W. H. MARTINEZ, M.D.

Duchenne, M. Localized Hypertrophic Osteitis of the Maxilla. Pathogenesis. (Origine hypertrophique locale des maxillaires. Considérations pathologiques.) *Presse med. Par.* 1934 4: 114.

The author reports in detail three cases of localized hypertrophy of the upper jaw. The ages of the patients were twenty-eight, thirty-four, and forty-six years respectively, and the duration of the disease ranged from a few months to five years. In each case the hypertrophy appeared clinically to be due to osteitis caused by infected teeth. The deformity was moderate, consisting of a diffuse swelling of the alveolar process. Roentgenograms showed mottling due to alternate areas of rarefaction and condensation, which was interpreted as evidence of osteitis fibrosa. Biopsies were made in each case. In two cases the specimens were sent to two pathologists, one of whom diagnosed the condition as a simple

osteitis, and the other as a fibrous osteitis closely related to giant cell tumor. In the third case, in which the condition seemed clinically to be definitely of an inflammatory nature, the pathologist reported a condition similar to that seen in leontiasis ossea. Studies of the blood revealed only a mild anemia in two cases.

In considering these hypertrophic changes in the upper jaw as a whole the author states that the histological changes are not sufficiently characteristic to serve as a basis of classification. Therefore to distinguish between giant cell tumor, localized von Recklinghausen's disease, leontiasis ossea, and hypertrophic osteitis of purely inflammatory origin it is necessary to rely upon clinical signs. The cause except when infection can be definitely established remains obscure. Changes in the blood and the endocrine organs are hypothesized.

The article contains six roentgenograms and five drawings of casts of the teeth and jaws.

AMBER L. DE GROOT, M.D.

Di Natale, I. Intraglandular Calciclosis of the Submaxillary Gland (La calciclosi intra ghiandolare della ghiandola sottomandibolare). *Arch. ital. di chir.* 1934 37: 217.

The author reports two cases of intraglandular calculi of the submaxillary gland and reviews the literature relating to these concretions.

His first case was that of a man sixty-four years of age who had noted a small painful nodule in the region of the left submaxillary gland for about twenty months. The nodule slowly increased in size. Following the application of alcohol preps over the gland the symptoms gradually subsided. After the initial attack the patient was relatively well until about one month prior to his admission to the clinic, when he noted pain and a burning sensation in the region of the left submaxillary gland. The nodular mass in this region had recently again increased in size and its borders had become less distinct.



Physical examination revealed a mass the size of a walnut in the region of the left submaxillary gland. The overlying skin was ulcerated. The tongue was displaced to the right by protrusion of the mass into the floor of the mouth.

Under local anesthesia, the author resected the entire submaxillary gland. The resected mass was about the size of a hen egg and in one pole there was calculus the size of a small nut. Histological examination of the resected gland showed a marked infiltration of the gland with round cells and fibroblasts, and destruction of large areas of gland tissue. The tubules were dilated and contained many small concretions in addition to cell debris.

The second case was that of a man thirty-four years old who, about one and a half months before his admission to the clinic, noted a small pea-sized nodule in the region of the right submaxillary gland. This nodule gradually increased to about the size of a small nut and became slightly painful especially during mastication. For five or six days there had been dryness of the mouth.

Physical examination disclosed a small, firm, nut-sized tumor in the region of the right submaxillary gland. The nodule was only slightly movable and not tender. X-ray examination showed an irregularly round shadow of bony density in the region of the right submaxillary gland.

Under local anesthesia the author removed the entire submaxillary gland. The postoperative course was uneventful.

The resected gland contained a small, yellowish-white nut-sized calculus. A small niche within the glandular tissue.

Histological examination revealed evidence of degeneration due to stasis secondary to occlusion of the secretory system.

From review of the literature on submaxillary calculi, the author concludes that the cause of the stone formation is not known. The calculi have been attributed to climatic conditions, diet, and heredity. They occur at all ages. They have been found in an infant of three weeks and in persons sixty-nine years of age.

The pathogenesis has been ascribed to stasis in a long tortuous Wharton's duct, but ligation of this duct in animals does not cause the formation of stones. The chemical theory attributes the formation of the stones to the production of salivary secretion supersaturated with mineral salts which are precipitated out of solution. The mechanical theory ascribes it to precipitation of the salivary salts around foreign bodies such as dental tartar, dead epithelial cells, food, and vegetable fibers lodging in the ducts. According to the infective or parasitic theory the calculi develop following infection of the gland. Various organisms such as leptotrix bacilli, streptococci, staphylococci, pneumococci, blastomycetes, and actinomycetes have been demonstrated in the calculi. The author is of the opinion that infection is an important etiological factor.

Pathologically the gland containing a calculus shows various stages of inflammation ranging from the mild reaction noted in the author's second case to suppuration and atrophy of the gland. Microscopic examination shows an endovascular and perivascular edema with dilatation of the excretory ducts, destruction of glandular tissue, and extensive connective-tissue proliferation.

As a rule there is only one calculus, but in some cases several small calculi are found scattered throughout the gland, usually in the intraglandular canaliculi. The calculi are small and round, and have irregular surfaces. They vary from grayish to yellow or brown. Calculi weighing as much as 93 gm. and measuring 5.5 cm. in length have been reported. The maximum circumference has been 5 cm. and the minimum 8.5 cm. Chemical analysis has shown calcium phosphates, carbonate organic material, magnesium and sodium chloride, uric acid, and iron.

Unlike stones in Wharton's duct, calculi in the submaxillary gland may produce no symptoms for a long time. As they increase in size, they may cause dull pain in the region of the involved gland. Rarely they may cause a decrease in the secretion of saliva with resulting dryness of the mouth or acute retention of saliva due to obstruction of one of the larger ducts. The gland usually becomes infected with consequent manifest signs of acute and chronic infection.

The differential diagnosis of intraglandular calculi from stones in Wharton's duct can usually be made on the basis of the history. As to regard to the occurrence of an acute salivary colic, catheterization of Wharton's duct, and roentgen ray examination. During the process of acute inflammation with enlargement of the gland, other inflammatory lesions and tumors in this area must be ruled out.

The treatment indicated is surgical removal of the entire gland. Although ligation of the gland with simple removal of the stone has been suggested, the author believes that this is not advisable as the gland is partly destroyed by the inflammatory process, its function is greatly diminished, and the danger of inflammatory complications after such treatment is greater than after extirpation of the gland.

PETER A. ROW, M.D.

## ETE

Thygesen, P. The Nature of the Elementary and Initial Bodies of Trachoma. *Arch Ophth* 1934.

397

Failure to produce trachoma in blind human eyes with various types of bacteria has been previously reported. That virus may be the cause of trachoma is suggested by (1) the absence of a known bacterial cause, (2) the positive filtrations reported by Neefe, Cuendet, and Haxiot, and (3) the presence of Hirschfelder-Proxach cytoplasmic inclusion bodies in the conjunctival epithelial cells.

The filtration experiments of three groups of investigators indicate that while the agent of trachoma

ma is generally not filtrable, the disease may some times be produced by bacteriologically sterile filtrates. It is possible that the usual inactivity of filtrates may be due to absorption of the agent by the filter rather than to the large size of the particles. The cytoplasmic inclusion bodies of trachoma are basophilic and heterogeneous whereas the inclusions characteristic of many virus diseases are acidophilic and homogeneous. This difference led to denial that the inclusions of trachoma are of virus origin, an objection which has been refuted by more recent investigation.

A detailed study of the nature of the trachoma inclusion and its components indicates that the initial and elementary bodies are stages in the life cycle of a virus which may be the etiological agent of the disease. The bodies are present in large numbers in the subacute stages of the disease but are often difficult to demonstrate microscopically in the chronic stages. They constitute intracellular colonies of the virus. The small inclusion made up of initial bodies is the early phase, and the large inclusion, made up of elementary bodies, is the late phase. By analogy with the phases of inclusion bodies in bluetongue and psittacosis the elementary bodies should constitute the infectious phase of the disease and the absorption of the elementary bodies of bacterial filters should explain the usual non-filtrability of the trachoma virus. Successful filtrations are possible by the use of graded collodion membranes with suspensions of elementary bodies in high concentration. Edward S. Platt, M.D.

Adson, A. W., and Benedict, W. I. Hemangioma-Endothelioma of the Orbit: Removal Through a Transcranial Approach. *Arch. Ophth.*, 1934, 12: 54.

Tumors caused by an increase in the size of normal vessels or the formation of new vessels occur in the orbit as angiomas of various types or varicosities with or without a direct arterial communication. If such tumors become pulsatile because of a copious arterial supply or because of juxtaposition to a large artery, they tend to become larger through expansion of the blood spaces and involvement of contiguous tissue.

Exophthalmos is the most frequently observed sign of the presence of an orbital tumor, but in cases of vascular tumors it is of particular significance. The situation of a vascular tumor within the orbit, its confinement by the bony walls, the volume of blood it contains, and other factors determine the intensity of the pulsation, the rate of expansion or growth of the neoplasm, and the character of the erosion of the bone.

Highly vascularized tumors of the orbit result from inflammation or injury or occur spontaneously. These include fibromata, endotheliomata, and lymphangiomata, a relatively benign group. The poor results are due to pressure on the globe and orbit.

From clinical data alone it is sometimes impossible to identify true angiomas and other highly vascu-

larized tumors. A copious mixture of arterial blood in the large venous spaces may be detected by tests for oxygen and carbon dioxide performed on blood withdrawn through a cannula, a valuable aid in the differential diagnosis of pulsatile tumors. Roentgenograms disclose erosion of bone, but do not clearly reveal the tough membranes which develop as a protection against expansion of the tumor and form important structures that may be utilized in surgical reconstruction after removal of the tumor.

On the basis of the principal reasons for the surgical attack the various methods of treating vascular tumors of the orbit may be grouped as follows: (1) ligation, (2) compression, (3) irradiation, (4) injection, and (5) extirpation. The procedure of choice in a given case depends on numerous factors. A combination of any of the conservative methods may be tried before extirpation is attempted. If surgery is undertaken, the surgeon should be prepared to ligate a carotid artery if necessary and to deal with sudden and copious hemorrhage.

Because of the difficulty of adequately controlling hemorrhage in the deeper parts of the orbit and the impossibility of going beyond the orbital walls to extend the operation as far as may be required, a frontal approach through the eyelids does not provide a sufficiently wide avenue for the operative attack. On the basis of previous experience in the treatment of cerebral meningiomas invading the bone and entering the orbit and on the basis of Nafziger's work on the treatment of exophthalmos, Adson and Benedict concluded that in the case of hemangioma-endothelioma of the orbit reported in this article it would be feasible to remove the moderately large vascular tumor by the transcranial approach. This approach proved to be adequate and effective.

In conclusion the authors state that the case with the hemangioma-endothelioma was removed suggests many possibilities for the transcranial approach to vascular and neoplastic lesions situated in the retrobulbar space of the orbit.

Castroviejo R. Keratoplasty. *Am. J. Ophth.*, 1934, 17: 932.

Of the three methods of corneal transplantation—total, partial superficial, and partial penetrating—the last yields the best permanent results. The corneal transplant must be obtained from the same individual or an individual of the same species.

Castroviejo reports on seven unselected cases of leucomatous cornea in which partial penetrating keratoplasty was performed. In some cases the leucoma allows examination of the anterior segment by the usual methods. When the leucoma is too dense for such an examination, anterior and posterior transillumination will yield information regarding the presence of anterior or posterior synechia. The best results are obtained when the leucoma is not too dense and there is little or no scarring in the surrounding areas.

The technique of the pre-operative and post-operative care is described in detail. The corneal

transplant and the opening in the cornea of the recipient must correspond in size exactly and trauma to the transplant must be avoided as much as possible. The transplant should be held in place by conjunctival flaps.

If the corneal leucoma is the only pathological change the conjunctival flaps will probably begin to separate and the transplant may be uncovered after two or three days. The conjunctival sutures usually come out from eight days to three weeks after the operation.

When there is heavy scarring of the conjunctiva around the cornea, a large iridectomy should be done first because of the tendency toward glaucoma. Transplants should be taken from emmetropic eyes with unaffected cornea which were removed under general anesthesia to prevent the corneal injury that occurs in removal under local anesthesia. Corneal transplants from glaucomatous eyes tend to remain opacified and later to become neblae.

The importance of blood grouping before keratoplasty is yet to be determined. In all of the last six cases reviewed by the author the blood was different.

In discussing this report, KEY described transplantation of the whole cornea—corneocycloplasty—for use in cases in which the cornea is too dense to allow sufficient nourishment of the transplant. The method consists of dissection of the whole cornea from Descemet's membrane together with a conjunctival flap, to prevent the aqueous humor from coming into contact with the new transplant.

CASTROVITTO agreed that the aqueous humor should not be allowed to remain in contact with the unprotected corneal stroma any longer than necessary but expressed the opinion that the use of an accurately fitted transplant with conjunctival flaps for pressure is an adequate method of obtaining a water-tight closure. On the basis of observations in animal experimentation, he believes that endothelium affords as good protection as Descemet's membrane. EDWARD S. PLATT, M.D.

Hope-Robertson, W. J. Hemangioblastomatous Cysts of the Retina. *Australian & New Zealand J Surg* 1934, 4, 15.

The author reports a case of hemangioblastomatous cysts of the retina because of the rarity of the condition and because of the important fact that von Hippel's disease is frequently associated with hemangioblastomatous cysts of the brain, kidneys, pancreas, liver, adrenals, and epididymis. The association of these cysts in the brain and retina and the liver and pancreas is called "Lindau's syndrome."

In some cases there may be a cyst of the brain and a polycystic kidney but no lesions of the retina, in others, a cyst of the brain or spinal cord but no other lesions and in a third group, cysts of the brain and retina. Lindau states that the disease is hereditary in 50 per cent of the cases and has been known to occur in three generations. In 5 per cent of cases of

hemangioblastomata of the retina there are associated hemangioblastomata of the brain. Except in the very late stages, the disease is easily diagnosed in the eye. Therefore when a patient later develops signs and symptoms of a brain tumor, the eye examination is a very useful clue to the nature of the brain lesion. In all cases of brain tumor the ocular fundi should be thoroughly examined not only for papilledema but also for hemangioblastomata, and in all cases of hemangioblastoma of the retina an examination of the central nervous system should be made. Hemangioblastoma of the retina may appear at any age after the second decade. It is more common in males than in females. The lesions are frequently multiple.

The patient usually presents himself complaining of falling vision. Darier says that epistaxis, cephalgia, and dizziness before the eyes are precursory symptoms. The majority of the cases reported seem to show that the visual defect comes on insidiously. In most cases the condition progresses to absolute blindness, usually with secondary glaucoma which in many instances necessitates enucleation of the eye. When detachment of the retina begins complete blindness soon results. On ophthalmoscopic examination the disease is characterized in the early stages by one or more round reddish tumors, like which one or more greatly enlarged and tortuous arteries and veins communicate. After the tumor has been present for some time it begins to produce the cyst which is the cause of the detachment. As the growth is composed of thin-walled capillaries it gives rise to repeated hemorrhages. The hemorrhages appear first in the retina and may then break through into the vitreous or if they break through the external limiting membrane, may penetrate between the retina and choroid. Numerous exudates appear in the layers of the retina. Eventually retinal proliferation may result and cause detachment. The cyst usually increases in size until the retina is completely detached.

The growths in the brain occur generally in the cerebellum and medulla. Lindau states that the lesions found in the kidneys and liver are not hemangioblastomata but represent an association of one type of congenital lesion with another.

LESLIE L. MCCOY, M.D.

Lillis, W. J. and Adams, A. W. Unilateral Central and Anterior Ischemic Paralysis of the Optic Nerve from a Fracture Extending into the Optic Canal. Report of Two Cases. *Arch Ophthalmol* 1934, 10, 300.

The authors report an unusual ophthalmological syndrome occurring in two cases following a fracture along the base of the skull which involved the optic canal and was not revealed by roentgenograms. The syndrome was so similar in both cases that it might be classed as almost pathognomonic. At the time of the injury both patients presented an ecchymosis of the eyelids and inequality of the pupils. The only visual complaint at the time of the injury was made in the first case and was due to partial bilateral optic atrophy.

plegia Both patients were dismissed from the hospital as well, and it was not until from six weeks to two months later that the progressive loss of vision was sufficient to impress them with the necessity for re-examination. At the time of the second ophthalmological examination in each case, identical changes in the perimetric fields were found and the pathological changes revealed by roentgenograms of the optic foramen were similar.

The authors believe that localized roentgenograms of the optic foramen might be of value at the time of injury and should be repeated at intervals if necessary. This technique has been simplified by Camp and Gianturco. Although the described syndrome apparently is rare following fracture along the base of the skull, it necessitates a guarded prognosis following any injury of the skull. Lillie and Adson believe that decompression of the optic nerve is indicated, but should be done early in the progress of the lesion before permanent injury has occurred.

Izley, T. K., and Fenton, F. G. The Advantages of Intravenous (Evipan) Anesthesia in Ophthalmic Surgery. *Brit. M. J.*, 1934, 2: 589.

Anesthesia induced by the intravenous injection of evipan has been used extensively in general surgery. The authors report on eighty-six ophthalmic operations in which it was employed. Special advantages of this type of anesthesia are the freedom of the operative field from cumbersome inhalation apparatus, the relatively low incidence of the usual after-effects of general anesthesia, safety in the cases of old and enfeebled patients, and a decrease in the intra-ocular tension during the anesthesia. The only contra-indications to its use are extensive disease of the liver and kidneys.

In the cases reviewed a solution of 1 gm. of evipan to 100 cc. of sterile water was employed. The dose varied from 4½ to 12 cc. of this solution. Children require slightly more according to weight. No preliminary medication is given. The drug is injected slowly until the patient is unable to count. At this stage half of the necessary dose has been administered and a like amount should be given at once. The average patient remains fully anesthetized for from fifteen to twenty-five minutes. A further injection may be given when the patient begins to recover from the first injection. In this way it was possible, in one of the cases reviewed, to obtain anesthesia satisfactory for an operation requiring an hour and a quarter.

SAMUEL A. DURR, M.D.

#### EAR

Gray, A. A. The Otosclerosis Problem Including Reports of Two Cases Examined Pathologically. *J. Laryngol. & Otol.*, 1934, 49: 629.

Gray states that the essential causative factor of otosclerosis is a gradually increasing defect in the vasomotor mechanism which governs the nutrition of the structures of the organ of hearing as a whole.

Included in this vasomotor mechanism are, of course, the axon reflexes. The stimulus which excites the vasomotor mechanism is sound and sound alone. Consequently the vestibular apparatus and the semicircular canals are unaffected in otosclerosis.

There is no evidence whatever of a defect in any of the endocrine glands or their secretions in otosclerosis. Neither is there any evidence of a defect in the bone metabolism of the body. On the contrary, the subjects of otosclerosis are, apart from their deafness, perfectly normal individuals with ordinary average health.

The deafness of otosclerosis bears very little relationship to the extent of the disease in the bone. It may be very severe when the stapes is hardly fixed at all.

The severity of the tinnitus bears no relationship to the extent of the disease in the bone.

The extent of the change in the bone bears very little relationship to the duration of the disease.

The extent of the changes in the bone appears to depend upon the age of onset of the disease. The earlier the otosclerosis begins, the more extensive will the bone lesion become.

The deafness of otosclerosis is to a large extent functional and the result of the insufficient supply of blood to all the nerve structures concerned in the perception of sound.

The greater frequency of otosclerosis in women than in men is due to the greater instability of the vasomotor system and the more frequent disturbances to which this system is exposed in women.

The changes in the bone show a remarkable bilateral symmetry, even to minute details. This symmetrical distribution is readily explained by the author's theory of the causative factor of otosclerosis. The vasomotor nerves governing the nutrition of the organ of hearing are anatomically symmetrical like other nerve structures in the body. Therefore, if structural changes occur as the result of defective functioning of those nerves such changes will be bilaterally symmetrical in their distribution.

JAMES C. BRASWELL, M.D.

#### MOUTH

Duyvrens, F. The Saliva. *Proc. Roy. Soc. Med.*, Lond., 1934, 27: 1583.

In a study of saliva the first problem is to obtain the saliva in satisfactory quantities. It should not be "stimulated" saliva as changes in the quantity are usually accompanied by changes in the quality of the secretion. The usual amount for testing is 20 cc. The author describes his method for collection and reports the findings of his studies with regard to the presence of hypophyseal hormones in saliva, the hydrogen ion content of saliva, and the salivary content of calcium and sulphocyanate.

He states that the pregnancy test of Zondek made with saliva instead of urine indicated that it is possible to diagnose pregnancy by means of a biological salivary reaction.

Two methods of determining the hydrogen ion concentration of saliva and a method of determining the buffer action are described. The buffer action appears of more significance and should be given more consideration. No conclusions are presented in this article regarding the clinical application of the information obtained by the tests described.

In alkaline saliva the phosphorus content is usually low and the calcium content high. In acid saliva the reverse is true. In regulating the calcium content of the saliva by diet the intake of phosphorus and of Vitamin D must be taken into consideration.

The author describes a method of ultra filtration which separates the various serum colloids from each other without causing changes in their chemical or physical qualities.

He states that sulphocyanate is always found in human saliva, but little is known of its purpose. The sulphocyanate content is definitely increased by smoking. Sulphocyanate compounds exert an effect upon the blood pressure which may be a factor in pyorrhea. A comparative study of the capillaries of the gums, skin, and nail beds with the Leica camera and the Leitz microscope has proved of aid in determining whether pyorrhea is due to local or general disturbance. CHARLES W. FREEMAN, D.D.S.

Land, C. C. A Comparison of the Apparent End-Results in Cases of Carcinoma of the Mouth in Relation to the Length of the Follow-Up. *Am J Cancer* 1934, 21: 335

According to the American College of Surgeons, satisfactory reports on the treatment of carcinoma can be based only on cases which have been followed at least five years after the treatment. This causes long delay before a report can be made on any improved form of therapy. There are many rapidly changing techniques, especially in the field of irradiation. For this reason the author made a statistical study of cases of carcinoma, comparing the results at the end of one, two, three, four and five years after treatment, in an effort to determine the mathematical relationship of the early results to the five year results.

The cases studied were treated by surgery or irradiation or both, depending on the extensiveness of the lesion. An effort was made to compare the efficacy of the methods.

Of the patients treated for carcinoma of the mouth whose condition was favorable at the time of the treatment and who remained alive at the end of one year a recurrence developed during the next four years in only 13. Of 33 others treated for oral carcinoma, all developed recurrence during the first year.

Of the 16 patients who were treated surgically for carcinoma of the lip and whose condition was favorable at the time of the operation 17 remained cured at the end of a year. At the end of five years, 8 still remained cured and 4 were dead or not traced.

In cases of carcinoma of mouth which are less favorable and were treated by irradiation, fewer

than one-half of the patients who were living and well at the end of one year were living and well at the end of five years.

Between the one-year and five-year period, the number of patients apparently cured declined from one-quarter to one-half.

The death rate from new primary buccal carcinoma was 15 times as great as the expected death rate from buccal carcinoma in a group of patients of the same age and sex and in all of the cases the death rate from new primary carcinoma was 3 times as high as calculated. LOUIS T. BRUNS, M.D.

Boyle, P. E. Intracellular Bacteria in a Dental Granuloma. *J Dental Res* 1934, 13: 197

Because of contamination of material used for culture or injection, the relationship between dental infection and systemic disease does not lend itself readily to experimental investigation. Direct histological evidence of intracellular organisms in dental granuloma is therefore of importance. The author reports a granuloma presenting such evidence which was found in the routine histological examination of 300 teeth. In the center of the solid tumor which was about 3 mm in diameter were many mononuclear phagocytes of the foam cell variety. Practically all of these cells contained numbers of Gram-positive, non-acid fast bacilli.

LOUIS T. BRUNS, M.D.

## PHARYNX

Hall, C. The Parapharyngeal Space: An Anatomical and Clinical Study. *Ann Otol Rhinol & Laryngol* 1934, 43: 793.

For an understanding of the etiology, symptoms, complications, and therapy of infection in the various regions of the neck a general knowledge of the deep cervical fascia is essential.

All of the important structures of the neck are contained within the bounds of a single large cervical sheath which extends from the base of the skull above to the upper end of the thorax below. This great cervical sheath is usually referred to as the "superficial layer of the deep fascia. Medial extensions of this layer give each structure a individual fascial envelope. From a practical standpoint, there are two deep divisions of the fascia: the visceral fascia or sheath, and the prevertebral fascia.

Within the visceral sheath lie the respiratory, vocal, and deglutitory organs in the neck and, in addition, the thyroid and parathyroid glands. When the sheath becomes quite thickened and passes in front of the bodies of the cervical vertebrae, the scalenus anticus, the longus colli muscle, the pharynx and sympathetic nerves, it becomes known as the "prevertebral fascia."

The alar fascia is an expansion which forms a confinement between the carotid sheath and the visceral fascia. Its importance lies in the fact that it completes the anterolateral aspect of the retro-

pharyngeal space throughout the entire length of the neck and separates this space from the lateral pharyngeal regions

The superficial layer of the deep fascia—the great cervical sheath—sends in a deep extension to encapsulate the submaxillary gland and another extension—the deep parotid fascia—which completes the capsule of the parotid gland except above

Thus, from a clinical standpoint, there are four definite deep cervical spaces (1) the submaxillary space, (2) the parotid space, (3) the retropharyngeal space, and (4) the parapharyngeal space with (a) an anterior compartment and (b) a posterior compartment (carotid sheath)

Practically, the deep cervical fascia can be divided into four parts (1) the great cervical sheath, (2) the visceral sheath, (3) the prevertebral fascia, and (4) the alar fascia

Every deep structure contained in the neck has its own individual fascial covering which it receives from the deep fascia. In certain areas the fascia becomes thickened and prominent—the carotid sheath, for example. In other areas it becomes so thickened as to form so called ligaments, such as the stylo-mandibular. In some regions of the neck there are reduplications or reflections of the fascial covering of one structure which render it directly continuous with the fascial covering of an adjacent structure. An example is the alar fascia. This plays a most important part in the formation of the anterior compartment of the parapharyngeal space

The parapharyngeal space is composed of two compartments, an anterior or prestyloid, and a posterior or retrostyloid. The posterior compartment is the carotid sheath and its contents. It extends from the base of the skull to the upper end of the thorax. The anterior compartment is normally a potential space and becomes an actual space only when it becomes the site of disease. It contains a small amount of connective tissue and usually a few lymph glands. It extends from the base of the skull above to the angle of the jaw below

Etiologically, there are three types of parapharyngeal infection

- 1 The type which follows tonsil surgery and is preceded by local anesthesia
- 2 The type in which there is an extension from a neighboring compartment.
- 3 The type in which the parapharyngeal space is the site of the initial invasion of the deep fascia and is not preceded by throat surgery

Pathologically, there are two types of cervical involvement

- 1 The phlegmonous. This is the most common. The signs of local inflammation are predominant.
- 2 The vascular. The symptoms are those of septicæmia, thrombosis, or embolism without accompanying signs of cervical phlegmon

There are four cardinal signs of involvement in the anterior parapharyngeal compartment (1) inability to open the mouth widely, (2) induration about the angle of the jaw, (3) fever, which may be

septic in character, and (4) medial bulging of the pharyngeal wall

The treatment of parapharyngeal infection is surgical. When the symptoms mentioned appear, early surgical drainage is imperative. To await fluctuation in the presence of these symptoms is to await complications

SAMUEL KAHN, M D

## NECK

Quix, F H. The Difficulties of Removal of the Cannula Following Tracheotomy (Die Beschwerden des Dekanülements nach Tracheotomie) *Nederl Tijdschr v Geneesk*, 1934, p 2306

Difficulties arising after removal of the tracheotomy cannula may be divided into those due to changes above the tracheotomy opening, those due to changes at the site of the opening, and those due to changes below the opening. The upper portion of the trachea can be examined without removal of the cannula by direct tracheoscopy for changes in the mucosa and perichondrium and incarcerated foreign bodies. After this examination has been made attention should be directed to the vocal cords and the tracheotomy opening. When air has easy access through the cannula the vocal cords are practically closed, but unless paralysis of the recurrent laryngeal nerve is present they open up when the cannula is closed. Bilateral paralysis of the recurrent laryngeal nerve is extremely rare, but may occur in cases of tumor, goiter, and wounds. Immobility of the vocal cords may be caused also by tuberculous or syphilitic affections. The subglottic region which is usually markedly swollen in diphtheria can be examined from above with the aid of an electrically illuminated spatula only when the vocal cords are separated. For examination of the region of the tracheotomy opening, removal of the cannula is necessary. By the introduction of an ear speculum it is possible to determine whether the respiratory difficulty is due to granulations. For examination of the region below the tracheotomy opening it is necessary to use a bronchoscope introduced from above or through the opening in the larynx. Proliferations interfering with respiration which are situated below the tracheotomy opening are not relieved by the use of a cannula however well it is fitted.

The treatment of the various conditions encountered requires the entire laryngoscopic instrumentarium. Granulations may be removed with forceps or by electrocoagulation. Inflammation of the perichondrium in the subglottic space requires long-continued treatment. To secure the best position for the cannula the opening should be made, not through, but below, the cricoid cartilage

(DUNCCKER) JOHN W BRENNAN, M D

Cutler, E C, and Schnitker, M T. Total Thyroidectomy for Angina Pectoris. *Ann Surg*, 1934, 100 578

The authors studied twenty-nine patients subjected to total thyroidectomy for the relief of angina

pectoris since December 93 at the Peter Bent Brigham Hospital, Boston. One patient with the most severe form of the disease (angina decubitus) selected for the operation.

Within four hours after the thyroidectomy there were 1 death due to coronary closure. There were four late deaths which occurred from five days to eight months and three weeks after the operation. Each of these deaths was of cardiac origin. In all of twenty-one patients followed for from 10 and one quarter to sixteen months the painless seizures were relieved. In ten, the improvement ranged from 90 to 100 per cent in four from 75 to 80 per cent and in five per cent. The criteria of improvement were chiefly the incidence and severity of the pain as indicated by the patient's use of nitroglycerine.

It was found that the reduction in pain was not proportional to the basal metabolic rate and occurred almost immediately after the operation and suggested that the mechanism of relief was different from that in cases of congestive heart failure.

Further investigation of skin temperature changes, the response to adrenalin before and after operation, the effect of adrenalin in the production of experimental epinephrine, and the known relationship between the thyroid, adrenal, and sympathetic system suggested that adrenal secretion might be an important factor in the causation of attacks of angina pectoris. Since the cardiac innervation is intact and thyroidectomy does not decrease the output of adrenalin, the thyroid postulates that the operation has a local effect which renders the cardiac mechanism less sensitive to adrenalin.

J. M. S. W. T. 17 M.D.

Alvarez-Cortez-Pineda, J. The Treatment of Laryngeal Tuberculosis (Tratamiento de la tuberculosis laringea). *Arch. de med. ciruj. y ginec.* 14 5 845.

Since, except in rare instances, laryngeal tuberculosis is secondary to pulmonary tuberculosis, the laryngologist and the pathologist should work close co-operation (and by such co-operation can the best result be obtained).

The treatment indicated for laryngeal tuberculosis is both general and local. The general treatment is based on rest, pure air, and nourishment.

The most effective treatment of both the laryngeal and the pulmonary lesions is collapse therapy, as special pneumothorax. The author believes that there must be some sympathetic nerve relation between the lungs and larynx to explain the usual bilateral involvement of laryngeal and pulmonary lesions and the parallel improvement under pneumothorax treatment.

1. Dilution of intracavitary pneumothorax, pleurocentesis, and thoracoplasty and tracheal injection of medicated oil has been used. Methods of general treatment include also the use of biological and medicinal preparations and drugs has been advocated.

The local treatment of laryngeal tuberculosis includes medical treatment, which is now used only for palliation in incurable cases the direct cure treatment. The direct cure though easy theoretical is in reality difficult. Some laryngologists have attempted to obtain it by anesthetizing or resecting the laryngeal nerve or performing tracheostomy. Heliotherapy, ultraviolet irradiation, roentgen irradiation, the high frequency cautery, and radioactive substances have been used. Heliotherapy and ultraviolet irradiation have been employed most frequently and have yielded good results.

Radical surgery has been abandoned in the treatment of laryngeal tuberculosis. The only three surgical procedures to be considered are surgery of the laryngeal nerves, glossectomy, and diathermocoagulation. Diathermocoagulation is now seldom used. The laryngeal nerve may be anesthetized with a 1 per cent solution of cocaine in alcohol or a 1 per cent solution of cocaine in Hoffmann's or Frey's procedure. The superior laryngeal nerve is best approached for resection through the vertical incision described by Leichtenberg as this is associated with the least hemorrhage.

Diathermocoagulation should not be employed for acute lesions, but may be used with care for stationary lesions such as by peripylastic degeneration of the cords, interarytenoid vegetations, tumor formations, and lesions localized in the epiglottis.

Gahano-circumcision is one of the preferred methods of treatment. Its action is not only understood as it not only destroy and regenerates tissues but also sterilizes a distance rendering diseased tissues normal. When the proper technique is used pain and hemorrhage are rare and mild. Gahano-circumcision is indicated chiefly in cases of early tuberculosis limited to one part of the larynx, such as the vocal cords or epiglottis, and lesions are limited to the epiglottis. It is dangerous when the arytenoid is much infiltrated and shows tendency toward carcinoma and in the presence of perichondritis and changes in the crico-arytenoid circulation. It is contraindicated also by certain general manifestations such as poor defense, rapid pulse, an irregular fever, and loss of eight (good) kilograms. It is necessary when it is very red, and the tissues should be burned deeply. Not over one fourth of the larynx should be excised. To prevent the formation of synchysis treatment of contralateral sides is indicated should be needed. B. H. Marmore, M.D.

Figl, F. A. Supraglottic Tumors: Methods of Treatment and Illustrative Cases. *Arch. Otolaryngol.* 1934, 20, 1.

Between January 9 and July 1934, 137 patients with malignant tumor of the larynx were examined at the St. Clinic. The thoracic cavity was the best procedure for the removal of malignant tumor from the supraglottic portion of the larynx is the procedure affording the most satisfactory

tory view of, and the nearest approach to, the lesion. Growths limited to the epiglottis can often be taken care of by diathermy and laryngeal suspension as satisfactorily as, and with less hazard than, by pharyngotomy. However, only inactive, fungating, or pedunculated lesions of limited extent should be treated in this manner. Pharyngotomy remains the most satisfactory means of dealing with most malignant tumors in this situation. Irradiation is a valuable adjunct to the surgical treatment of supraglottic tumors, but should rarely be used alone.

The indications and technique of the procedures of value in the treatment of these lesions are presented together with illustrative cases.

Loré, J. M. Stripping of the Vocal Cords. *Laryngoscope*, 1934, 44: 803.

In experiments performed by the author on cats one vocal cord was removed and the other was left to serve as a control. The removed cord was examined microscopically to check it against the cord newly formed. At various intervals after the removal the larynx was examined by direct laryngoscopy to note the degree and method of healing. After complete healing had taken place, the larynx

was removed and the newly formed cords were examined microscopically and compared with the original cord removed. The findings indicated that a vocal cord will regenerate structurally. The only difference noted was that the new cord was thinner than normal, but the author believes that if the new cord had been examined later, even this difference would not have been observed. Functionally there was no impairment in the movements of the cords, but there was some change in the voice.

In a second series of experiments wedge shaped pieces or irregular portions of a cord were removed and the end-results after healing were studied. The cords so treated showed a tendency to bow because of scar-tissue formation, but to compensate for the concavity in the new cord the normal cord became convex. The end-result was a good voice.

An attempt was made to straighten out bowed cords by removing subjacent tissue from the anterior and posterior thirds of the cord. In three cats, however, the result was unsuccessful.

In conclusion the author reports four clinical cases in which one or both vocal cords were entirely stripped off with satisfactory results.

J. THORNWELL WITHERSPOON, M.D.



# SURGERY OF THE NERVOUS SYSTEM

## BRAIN AND ITS COVERINGS CRANIAL NERVES

Rossey G. and Mosinger N. *A Study of the Intermediate Lobe of the Hypophysis (Étude du lobe intermédiaire de l'hypophyse)* Ann. Anat. Path. 1934. 653

The discovery by Zondek and Krohn of Intermediate Lobe has awakened renewed interest in the intermediate zone of the hypophysis. The immigration of gland cells into the posterior lobe and the formation of cysts in this lobe present histophysiological problems of the greatest interest.

The authors studied hypophyses of adults and old persons, 6 hypophyses of children from few months to seventeen years of age, and the hypophysis of a fetus eight months of age. They paid special attention to the hypophyseal fissure and the diverticula which occur in it in children, the acro-albuminous glands of the intermediate lobe, and the infiltration of the posterior lobe by gland cells.

They describe the cells lining the hypophyseal fissure and show them with photomicrographs. These cells, whether mesenchymatous, epithelial, glandular or acro-endocrine, seem to be important physiologically. They contain siderophile granules.

The anterior wall of the hypophyseal fissure is generally considered to belong to the anterior lobe, and the posterior wall to form part of the intermediate lobe. This is true in the lower mammals, but in man the cells covering the anterior and posterior walls are very much alike and there are evidences that both of these zones belong to the intermediate lobe. According to Haller the hypophyseal fissure opens into the subarachnoid space, but the authors hold that the openings described by Haller were artefacts and that the epithelium of the anterior wall of the hypophyseal fissure enters into direct contact with the pia mater.

There are 5 groups of diverticula of the hypophyseal fissure: the superior, the inferior, the lateral, the anterior and the posterior. Some of the posterior diverticula become transformed into basophilic cords. The basophilic cells of the intermediate lobe therefore come not only from the posterior, all of the fissure but also from the posterior diverticula. The superior diverticula and some of the lateral diverticula give rise to certain colloid cysts of the anterior lobe. The inferior diverticula bring about infiltration of the capsule of the hypophysis and infiltration of the lower segment of the hypophysis by basophilic cells. The posterior diverticula may penetrate deeply into the posterior lobe and become transformed into either basophilic cords or serous glands. Some of the lateral diverticula may also penetrate the posterior lobe.

The glands of Eridheim or the acro-albuminous glands of the intermediate lobe are either simple or compound tubular glands which have a marked histological resemblance to the serous glands of the nasal mucous membrane. They result from secondary differentiation of the posterior diverticula of the hypophyseal fissure. Their histological appearance is described in detail and shown with photomicrographs.

There has been great deal of controversy with regard to the way in which the gland cells invade the posterior lobe. It is uncertain whether they originate from proliferation or active migration. It is probable that they arise to certain extent from proliferation. The zones of infiltration are also frequent sites of adenomata with basophilic cells. However active immigration also occurs with the proliferation. The infiltrating cells in children are of the pure basophilic type. In adults, particularly old persons, there are many eosinophiles. Chromophobe cells are rare.

There is great deal of difference of opinion also as to the origin of the gland cells of the posterior lobe. Some investigators hold that they originate from the anterior lobe, whereas others think that they come from the intermediate lobe. The authors have found that in children with the hypophyseal fissure intact the infiltrating cells come solely from the basophilic tracts of the intermediate lobe. In the adult their origin is more difficult to determine because of the direct continuity between the anterior lobe and the intermediate lobe and the lacystic spaces. However the presence of eosinophilic cells suggests that the anterior lobe contributes at least some of the infiltrating cells. It is the eosinophilic cells which give rise to the pigment of the posterior lobe.

ANNALS OF THE ROYAL COLLEGE OF SURGEONS IN IRELAND

Locher W. and Jacobl, W.: The Importance of the Intracranial Pressure in the Circulatory Conditions of the Brain to Arteriographic Visualization (Die Bedeutung des Hirndruckes fuer die Durchströmungsverhältnisse im Gehirn in arteriographischer Darstellung) Zentralbl. f. Chir. 1934. p. 793

The pressure conditions in the brain have an exceptionally strong influence upon the nature of the blood circulation. Under normal conditions arteriography shows that the blood pressure in the carotids is very accurately balanced between them. In the stenogram it is impossible to demonstrate the passage of blood from one carotid region to the other this fact constituting evidence that the passage of blood in perceptible quantities from one carotid into the other in the brain cannot take place normally. The large communications of the arteries

# SURGERY OF THE NERVOUS SYSTEM

Phillips, G. Radiography in the Diagnosis of Intracranial Tumors. *Australian & New Zealand J Surg.* 1934, 4, 30

of the brain, particularly at the base of the latter, serve essentially as reserve canals. In a normal arteriogram one sees with exactness only the vessels belonging to the region of one carotid interna in the brain. The connecting branches to the vertebral artery on the same side are never visible.

When the diameters of the vessels of one side of the brain vary from those of the blood vessels, side—for example, in diseases of the other side—arteriosclerosis, or lesions—the arteriogram changes. We then see in the arteriogram (in addition to the vascular region of one carotid) increased intracranial pressure also changes the circulation of blood in the brain very markedly, particularly when the pressure is increased in only one half of the brain, anterior and middle cerebral fossae the contralateral (arteria pericallosa marginalis) are almost always filled on the normal side, a very important sign of the presence of a tumor.

In cases of tumor of the anterior and middle cerebral fossae this roentgen sign is never missing. In cases of tumor of the posterior cranial fossa it is inconstant. On the other hand, in cases of large tumors of the posterior cranial fossa with extraordinarily strong pressure on the basal vessels, the basal vessels also appear in the roentgenogram. In hydronephrosis which is equally well developed on both sides this sign is absent.

The article contains a series of statements regarding which support the authors' statements regarding severe arteriosclerosis and tumors. The authors present also the arteriogram made in a case of hydrocephalus which they believed was due to a tumor. The findings in the arteriogram were those expected. In the lateral view only the vessels of the injected side were visible, and in the anteroposterior view the anterior cerebral artery was exactly in a vertical line and therefore in the normal position. Subsequent ventriculography showed a high grade hydrocephalus. When arteriography was repeated, the arteriogram was very different from the arteriogram as it showed the passage of blood from one side of the brain to the other through the arterial communicantes. It therefore proved roentgenologically that ventriculography can basically change the circulatory conditions in the brain and it thereby explained why ventriculography carried out in the presence of pathological anatomical changes in the brain with resulting abnormal pressure conditions, especially in cases of tumors, is often not well borne. Arteriography does not change the circulatory relationships in the brain. With respect to the latter arteriography is considerably safer than ventriculography and therefore can be carried out even when the general condition is very poor, under which circumstances ventriculography is contraindicated. (LOEHR) HARRY A. SALZMANN, M.D.

Roentgenographic signs of value in the diagnosis of increased intracranial pressure include (1) convolutional thinning or "thumbing" of the inner table of the skull, (2) separation of the sutures (particularly in children before bony union of the sutures has taken place), and (3) distention of the pituitary fossa without erosion of the dorsum sellae. These changes result in a "ballooning" of the sella turcica whereas in cases of pituitary tumor the enlargement is accompanied by an irregular erosion of the dorsum with a change in the contour of the clinoid processes.

In the localization of the site of an intracranial tumor the following signs are of value: (1) calcification, (2) erosion of bone and hyperostosis, (3) increased meningeal irrigation, (4) a lateral shift of the pineal gland, and (5) ventriculographic signs. Calcification is seen in 20 per cent of intracranial tumors. It is most frequent in craniopharyngeal pouch cysts, oligodendroglioma, and meningioma. Its presence is of some value in the prognosis as it indicates a low degree of malignancy. Erosion and hyperostosis are fairly common. The former is slightly more frequent than the latter. Erosion is seen fairly often in meningioma and pituitary tumors but rarely in subtentorial tumors. The increased meningeal irrigation or marked increase in the blood supply to the tumor and surrounding tissues subjects the adjacent bone to pressure producing erosion. The erosion results in deepening and widening of the channels on the inner surface of the skull bones, which then appear as channels of rarefaction. Lateral shifting of the pineal gland is rarely of aid in the diagnosis of brain tumors.

Air is used as a contrast medium in X-ray examination of the central nervous system in three methods: ventriculography, encephalography, and lumbar insufflation. Lumbar insufflation consists in introducing from 5 to 10 c.cm. of air into the lumbar space. This procedure is much safer than ventriculography and encephalography as it is followed by a less severe reaction. However, it requires considerably more care in the taking of the roentgenograms and considerably more experience in their interpretation. As incomplete filling of the ventricles renders the diagnosis difficult and complete filling is dangerous, determination of the proper amount of air to introduce is of great importance.

The ventricular distortion produced by an intracranial neoplasm is usually accompanied by some displacement of the septum lucidum. Roentgenograms which show apparent distortion due to filling defects always show the septum lucidum in the normal midline position. Whenever there is obstruction of the system posterior to the upper end of the aqueduct of Sylvius bilateral symmetrical hydrocephalus is present. In cases of tumor producing obstruction in the region of one foramen of Monroe only one ventricle is dilated.

In cases of hemispheric tumors, whether extra cerebral or intracerebral, the object of ventriculography is to determine the position of the septum luctidum and the size, shape and position of the lateral ventricles. Because of the relatively silent nature of the regions in which they arise, the tumors most frequently requiring ventriculographic examination are the prefrontal, parasagittal, and post parietal neoplasms. **JOHN WILKINS ERROR, M.D.**

Gross, S. W. Tumors of the Brain in Infancy: Clinical and Pathological Study. *Am. J. Dis. Child* 934, 45 730

Of the nine cases of brain tumor in infants which are reviewed by the author eight were those of males. Hydrocephalus was present in all. Seven of the tumors were located in the midcerebellar region, the most common site of brain tumors in infancy. The neoplasms included three ependymomas, one pilocystoma, one astroblastoma, one astrocytoma, two medulloblastomas, and one embryonic tumor of neuro-epithelial origin not definitely classified.

In discussing the diagnosis Gross says that many of the signs on which reliance is placed in the study of diseases of the nervous system in later life are invalidated by the chaotic state of the neurological reflexes in infancy. Hence, in the cases of infants it is necessary to depend more on the history and the infant's general behavior. Ventriculography which has proved of great value in the demonstration and localization of tumors of the brain in later life is not helpful in the cases of infants.

Subdural hematomata occur much more frequently in infancy than has been realized and so often the cause of enlargement of the head. By careful taking of the history and clinical studies, this condition can usually be differentiated from tumor of the brain. In the differential diagnosis, hydrocephalus due to other causes, notably obstruction of the aqueduct due to an inflammatory process or a congenital defect, communicating hydrocephalus, and atresia of the brain, must be ruled out.

**JOHN WILKINS ERROR, M.D.**

Eggleston, A. A. Pathways of Infection in Suppurative Meningitis. *A. Child Head & Larynx* 934, 43 67

A review of 363 deaths occurring in an eye, ear nose, and throat hospital in the period from 1900 to 1933 revealed that 43.8 per cent of these deaths resulted from suppurative intracranial disease. There were 11 cases of meningitis, 35 cases of brain abscess, and 14 cases in which these conditions were associated.

The regional venous circulation is of prime importance in the spread of infections to intracranial structures. This spread is usually brought about by a septic thrombus and may occur in a retrograde manner against the circulation. The primary focus may be an infection in the auditory apparatus, paranasal sinuses, or cavernous sinus, or an infection following an accident or operation.

Cavernous sinus thrombosis, from whatever cause, usually results in a diffuse distribution of infection in the leptomeninges through the numerous tributary veins of the brain. Infections following surgical procedures may be due to accidental breaking through of the bone or pre-existing osteomyelitis. Infections arising from the paranasal sinuses are attributed to contiguity or a suppurative phlebitis. The frequency of intracranial infection following frontal sinusitis as opposed to its rarity in osteomyelitis of the skull is believed due to carotidocross of the posterior wall of the frontal sinus.

The pathways of infection from diseases of the temporal bone are numerous and complicated. The venous connections of the labyrinth, tympanic cavity, and petrous pyramid become involved and spread infection in the brain through phlebitis. However, unless the suppurative thrombus ruptures into the pia arachnoid, meningitis or abscess may not occur.

Infection may spread through the petrosular or petrosulabyrinthine cells to the tip of the petrous bone. There it may cause an osteitis or an osteomyelitis with an extensive accumulation of pus if the bone is pneumatized bone. The petrous bone is coming to be generally recognized as a source of meningitis. There are three natural avenues of infection from the ear to the intracranial space: (1) the aqueduct of the cochlear with the perilymph space between the bony and membranous labyrinth, which offers a direct communication with the cerebrospinal fluid; (2) the ductus endolymphaticus, which terminates in the sacculus under the layers of the dura; and (3) the extension of the petrosular sheath from the labyrinth to the posterior cranial fossa.

**JOHN WILKINS ERROR, M.D.**

Oltrevrona, H. C. Parasagittal Meningiomas (Die parasagittalen Meningeome). 934, Leipzig, Thieme

Although this monograph of 243 pages with 145 illustrations deals only with parasagittal meningiomas on the basis of 31 cases observed by the author, it reflects the status of brain surgery as it has been developed in the course of years by Oltrevrona. It is profitable to study the 31 case histories which are presented in a very exact manner and thereby to follow the development of Oltrevrona's surgical technique step by step up to its present high level. In addition to the case reports there are chapters on the pathological anatomy, symptomatology, diagnosis, operative technique, and after-treatment.

In contrast to Cushing, Oltrevrona includes with parasagittal meningiomas only the tumors found on the falx and directly on the sinus. From the point of view of the operative technique, meningiomas over the convex surface of the brain, even when they extend few millimeters to the sinus, are not classified as parasagittal meningiomas.

Of the 31 parasagittal meningiomas reviewed, 10 were located in the anterior third of the sinus, 14 in the middle third, and 7 in the posterior third, and 7 were true falx meningiomas. According to

# SURGERY OF THE NERVOUS SYSTEM

Olivecrona, at least one third of all parasagittal meningiomata are bilateral. Multiple meningiomata are very rare. Olivecrona has seen only 1 case.

The diagnosis in the cases reported was based on the neurological symptoms and the findings of roentgenography and ventriculography. In very numerous instances the study of the ordinary roentgenogram revealed erosion of bone, spiculation, massive proliferation of bone, and enlargement of the cranial veins and the furrows for the meningeal vessels—all important diagnostic findings. Numerous roentgenograms are included in the article. Although Olivecrona demands a strong indication for ventriculography, he apparently uses it frequently and with good results, not only for diagnosis but also to make sure that the operative plan is correct. He emphasizes that ventriculography should be followed at once by the operation.

While Olivecrona usually prefers rectal anaesthesia for brain surgery, he considers local anaesthesia sufficient in cases of parasagittal meningiomata. In the latter, however, he gives liberal doses of luminal for its sedative effect. The skull is opened in such a manner that the bone flap, which is always performed in the direction of the temples, extends beyond the midline so that both sides of the bilateral tumor may be reached. With regard to the question of ligation and resection of the sinus Olivecrona is very reserved. He states that when the sinus is entirely compressed or filled with the tumor it may be resected without hesitation since, under such circumstances the venous outflow has been gradually re-routed from the cerebral veins. On the other hand, ligation of the sinus when it is permeable leads to disturbances of the circulation in the brain itself and, for example, in cases of tumor of the middle portion of the sinus, to disturbances of the innervation of the lower extremity. Whenever possible Olivecrona avoids removing tumors close to the sinus and falx. As a rule he opens the dura on the convexity close to the sinus or falx while the tumor in the direction of the vessels, and then resectes progressively caring for the point of attachment. Only in exceptional cases does he find it sufficient to destroy the point of attachment by diathermy. As a rule he attempts to remove the tumor in one operation. He states that procedures to relieve pressure, such as subtemporal decompression, should not be employed in cases of meningioma. Since his adoption of the practice of giving blood transfusions (from 1 up to 6) during the operation to counteract the low blood pressure caused by the considerable loss of blood, radical removal of the tumor in one operation has become the rule. He has given blood transfusions in 80 per cent of his cases. Drainage through a special opening close to the wound which has been sutured in layers is practical and not associated with danger of cerebrospinal-fluid fistula formation. When drainage is not employed it is frequently necessary for several days to remove the

accumulation of fluid by puncture. The pulse curve, the blood-pressure curve, and the chemical therapy should always be watched carefully.

Of 34 patients, 15 per cent died from the intervention and 10 per cent died from recurrence. In 25 per cent healing occurred with a defect, and in 50 per cent complete healing resulted.

(LEHMANN) CLARENCE C REED, M D

Krabbe, K. H. Facial and Meningeal Angiomatosis Associated with Calcifications of the Brain Cortex. A Clinical and Anatomopathological Contribution. *Arch Neurol & Psychiat*, 1934, 32 737

The clinical association of angiomata of the face with angiomatous modifications of the pia mater and cortical calcifications is described as representing a clinical entity. There is almost always an associated epilepsy, and frequently the patient is considerably overweight. Other frequent symptoms are mental debility and a slight spastic hemiplegia on the side opposite the facial angioma. X-ray examination reveals a characteristic shadow within the skull—a distinct sinuous shadow presenting exactly the shape of the surface of the brain and showing the gyri and sulci, often with double contours. The shadow is most often localized in the occipital lobe.

The first report of a case to be published was that of Weber in 1922. In 1921, Wissing described a roentgenographic shadow in the right occipital lobe in an unpublished report. Another case report was published by Dimitri in 1923. Since then several reports have appeared. Cases of massive calcifications associated with angiomata of the brain have been recorded but only a few have shown the characteristic sinuous shadows corresponding to the brain surface which were originally described by Weber and Dimitri. In the previously reported cases of the latter type histological examination was impossible as none of the patients died.

Krabbe reports five cases, in one of which a pathological examination was made. In four of the five the lesion was wholly or mainly in the occipital lobe. In the fifth it was in the parietal lobe.

The histological examination showed that the shadow was due to calcification of the outer layers of the cortex, not of the pia mater, which seemed to be abundantly vascularized but not truly angiomatous. The calcification consisted of numerous small, mostly microscopic, granules of calcium salt, localized in the second and third layers of the cortex. The nerve tissue in these layers had been in great part destroyed and replaced by fibrillar neuroglia. The occipital lobe was shrunken and sclerotic. The rest of the brain was apparently normal except for very slight changes in certain areas.

The author believes that the changes in the brain are probably not secondary to angiomata of the pia mater, but related to a more generalized malformation of the organism. This consists in the formation of angiomata of the face, slight angiomatous changes of the pia mater, and aplasia of the occipital lobe with

selevents and calcification of the aplastic part. The malformations probably originate in fetal life.

The only therapy indicated is symptomatic treatment for the epileptic seizures and mental hygiene for the mental defects.

The name Weber Dinielt's disease is suggested for the condition if it is proved to be a separate entity  
Edward S. Platt, M.D.

Fenton, R. A.: Diagnostic Factors Concerning Herpes Zoster Oticus. *J Am M Ass* 1934, vol. 463

It now seems generally agreed that the infectious agent in herpes zoster is a filtrable virus which enters the body through the nose or nasopharynx instead of the skin. This virus involves the nerves and leads to an ascending or a descending infectious process with definite serum reactions and antibody formation.

Involvement of the eighth nerve is characterized by vesicle formation which may be limited to the posterior all of the external auditory meatus or manifested by only one or two small lesions on the concha or mastoid, pain which occasionally ceases when the vesicles dry up, but usually lasts for weeks and sometimes for months, enlargement of a pre-auricular lymph node and occasionally of mastoid, cervical, and parotid lymph nodes, loss of tactile sensibility and sometimes vesicles on the anterior two-thirds of the tongue, the anterior pillar of the fauces, or the soft palate of the same side. Facial paralysis may supervene four or five days later. In rare instances it occurs coincidentally with or preceding the eruption. The usual delay of several days in the development of motor symptoms supports the generally accepted theory that such symptoms are due to secondary pressure on, and rupture of, motor nerves passing through the bony canals, foramina, or dural envelopes.

Vestibular and auditory symptoms, moderate vertigo, slight deafness, and buzzing noises may precede the eruption by several days or develop simultaneously with it. The deafness, which is of a transitory character, is usually more annoying than the disturbances of hearing. Various combinations of nerve involvement have been recorded, especially involvement of the eighth cranial nerve with other cranial nerves.

The following types of herpes zoster oticus, varying in severity, are recognized: (1) a very mild superficial type simulating eczema, (2) a very severe type with rheumatic symptoms, (3) a type with dermal manifestations resembling erysipelas and followed by facial palsy and (4) a type with cochlear vestibular disturbances which may be very severe and is followed by facial paralysis in about 15 per cent of cases.

The condition must be differentiated from pericardial swelling due to mastoiditis, edema from furunculosis, eczema, erysipelas, fungoid eczema of the mental epithelium, intracranial hemorrhage and thrombosis, encephalitis, meningitis, and intracranial tumors and abscesses.

The treatment indicated is largely symptomatic although serum from cured cases is stated to relieve or shorten the duration of the postherpetic pain. Shock therapy with foreign proteins and auto-hemotherapy may be of value. Ultraviolet irradiation, local drying treatment, and coablation of the aphoroplastic region are recommended.

JOHN WILLIAMS EMMETT, M.D.

## SPINAL CORD AND ITS COVERINGS

Borchardt, M.: Kyphoscoliosis and the Spinal Cord (Kyphoscoliose und Rückenmark). *Schweizer Medische Wochenschr* 1934, 613

Symptoms of transverse lesion of the spinal cord which in the course of a few weeks lead to spastic paraplegia of the legs, sensory disturbances, and occasionally also to bladder and rectal disturbances occur more frequently in congenital scoliosis than in rachitic scoliosis. They are most common in the second decade of life, the period of most rapid growth. The neurological findings show considerable differences from other spinal-cord conditions. Characteristic of late scoliotic injury is the rapid development of severe sensory disturbances of all types. In contrast to the transverse myelitis of spondylitis, the individual functions are not completely destroyed. The hyperaesthetic zone found in cases of tumor is absent. At operation on young persons with late scoliotic injuries, an abnormal tension of the dura is always found. After incision of the dura, the cord protrudes and as a rule cannot be entered again. Nevertheless, the operative results are usually good. When the dura is sutured under tension the condition becomes worse.

Borchardt has observed three cases. The first was that of an old woman in whom spinal-cord symptoms associated with scoliosis were due to an intradural, extramedullary true spinal cord tumor. Operative removal of the tumor was followed by recovery.

In the second case, that of a fourteen-year-old boy with rachitic scoliosis, severe symptoms of spinal-cord injury began without apparent cause during the period of most active growth. Hyperaesthesia and hyperalgesia were found on the right side from the second cervical to the fourth dorsal vertebra and from the tenth dorsal to the fifth sacral vertebra, and on the left side from the fourth dorsal to the tenth dorsal vertebra. Repeated lumbar punctures were followed by cure. On the basis of the clinical picture the condition was believed to be circumscribed aseptic serous meningitis in the cervical region.

The third case was that of a man forty years old who had very marked kyphoscoliosis. Severe symptoms of compression myelitis appeared suddenly. On myelographic examination the lipiodol remained at the point of greatest curvature. Operation was refused at first, but permitted later. It showed the canal to be greatly narrowed at the apex of the curvature and the dura to be definitely pinched. The dura was not under tension or pathologically

## SURGERY OF THE NERVOUS SYSTEM

adherent to the spinal cord. After it was opened, it could be sutured easily without tension. Postoperative healing was uneventful. Two months later the patient died of decubitus, cystopyelitis, and bronchopneumonia. Autopsy showed the cause of the compression myelitis to be a localized osteitis fibrosa of the Recklinghausen type with cysts and brown tumors of the ninth and tenth dorsal vertebræ, destruction of these vertebræ, and compression of the cord.

Borchardt agrees with Jaroschy that the transverse myelitis in severe scoliosis is due to a disturbance of the blood and lymph circulation incident to the scoliosis. As the result of venous stasis and swelling of the cord, the canal becomes narrowed and drainage is obstructed. The frequent narrowing of the canal at the vertex of the curvature and the torsion of the dural tube are also damaging. In cases with mild symptoms of irritation, rest in bed or the wearing of a corset should be prescribed. In more advanced cases Glisson's hammock is indicated and if there is no improvement after two months laminectomy should be done.

(TOBLEY) LEO A. JUENKE, M.D.

**Salman, A. S.** Chordotomy and Its Late Results  
*Nor. Khir. Arkh.*, 1934, 31: 181

The therapy of pain is one of the most interesting problems of neurosurgery. Attempts have been made to relieve pain by transverse myelotomy, but the operations which have been found of most practical value for this purpose are performed on the sensory tracts of the spinal cord.

Following the studies of Brown-Séquard and Gowers on the physiology of these tracts, the first chordotomy was performed by Martin in 1911. From the literature since that time the author has collected 720 cases in which this operation was performed.

At first, chordotomy was done only for pathological processes of the lower extremity as surgeons feared lesions of the nerves of respiration. However, in 1927 Förster performed a unilateral chordotomy and in 1931 Stookey performed a bilateral chordotomy at the level of the second and third cervical segments without causing disturbances. Rotmann performed the operation in cases of inoperable tumors and Schuelter performed it in cases of tabetic crises. During recent years the indications have been extended to include all pathological processes causing pain.

The author performed fourteen chordotomies on thirteen patients. The indications were inoperable carcinoma of pelvic and abdominal organs, sarcoma of the pelvic bones, traumatic injuries of the spine, post-amputation pains, trophic ulcers, and syringomyelia.

The operation was done under ether anesthesia in nine cases and under local anesthesia in four. The incision of the anterolateral tract was 3 mm deep. By unilateral chordotomy, total analgesia was obtained in ten cases. In one case, analgesia of only the foot, and in the last case no analgesia was obtained. In the cases in which bilateral chordotomy was done the evaluation of the results was very difficult. The failure of some interventions can be explained by anatomical variations in the anterolateral tract and also, as suggested by Förster and Hagel, by the fact that this tract may become incorporated in the posterolateral tract.

As a rule thermal sensibility is also lost in the area of analgesia. According to Robineau, this is an indication that the operation was performed correctly. The other forms of sensibility are not affected. In some of the author's cases the level of the anesthesia changed after the operation. In one case it was two segments lower fifteen days after the chordotomy. In some cases sensibility was restored, but was weaker than before the operation. Among the possible complications following chordotomy is paralysis of several muscles from injury of the pyramidal tract. This occurred in three of the author's cases. In nine of the author's cases there were disturbances of the urinary tract. Chief among these was retention of urine.

Microscopic examination of the spinal cord after chordotomy showed partial necrosis and other lesions of the fibers attributable to the operation. These changes are responsible for the high postoperative mortality. Other causes of postoperative death are shock and infection.

Of the author's patients, one died of acute meningitis twelve days after the operation. One patient with sarcoma was still alive fifteen months after the operation, but another died seven months after the operation from multiple metastases. Six patients with carcinoma died after from one to five months. In one case of post-amputation pains the results were satisfactory and stable, but in another the symptoms recurred six months after the operation and in a third the late results were poor.

M. SILBERBERG, M.D.

# SURGERY OF THE CHEST

## CHEST WALL AND BREAST

Lewis, D. and Geschickter C. F.: *Gynecomastia, Virginal Hypertrophy and Fibro-Adenomas of the Breast*. *Ann Surg* 934, no 779

Careful histological studies of the breast tissues in cases of gynecomastia, virginal hypertrophy and fibro-adenoma of the breast revealed details similarities of structure and suggested that these conditions may have a common etiological factor. All seem to be definitely related to the overproduction of the female sex hormone oestrin and its conditions or times of life during which there is constant stimulation by this hormone.

Gynecomastia, or abnormal enlargement of the male mammary gland, is due to proliferation of the ducts and an increase in periductal tissue, and has been observed in many cases of chorio-epithelioma and teratomas of the testicle. In most of these cases the urine was found to contain both Prolan B and oestrin. Gynecomastia is often associated also with hermaphroditism and pseudohermaphroditism, and has been found in cases of tumor of the hypophysis and of the suprarenal glands. It can be produced experimentally in monkeys by the injection of solutions of varying amounts of oestrin.

Virginal hypertrophy, histologically similar to gynecomastia, seems to be definitely related to the prepuberty period, when there is normally continuous production of small amounts of oestrin for from three to five years before the onset of menstruation. It is apparently the general response of the breasts to such stimulation. The local response takes the form of fibro-adenomata which are frequently associated with a lesser degree of virginal hypertrophy and present changes very similar histologically to those of the two other conditions.

Fibro-adenomata are relatively common during the sex life of women. Significant features in the series of 480 cases studied by the authors are:

The association of solitary fibro-adenomata with diffuse enlargement of the breast (virginal hypertrophy).

The slow prolonged growth, averaging from three to four years, and the tendency toward involvement of a secretion of the breast or the formation of multiple tumors.

The tendency of the tumors to appear during puberty or pregnancy.

The similarity of the histological changes to those observed in gynecomastia.

Most of the patients were between twenty and twenty five years of age. About one-third of the tumors were tender. The tumors increase in size rarely during menstruation, but not infrequently during pregnancy. Early tumors are of a loose

myxomatous structure while those of longer duration are more solidly fibrous. Microscopic studies suggest that fibro-adenoma formation is essentially an exaggerated puberty hypertrophy. In most fibro-adenomata no acini formation is found and the histological changes resemble those seen in gynecomastia. Determination of the amount of oestrin in one such tumor revealed nearly 50 times as much as is obtained from the ovaries of the cow, a finding which suggests that the tissue is capable of holding or concentrating the hormone. The fact that the tumor formation begins or increases during puberty or the latter part of pregnancy when the amounts of oestrin are increasing, is also regarded as significant.

J. E. THOMAS, M.D.

Geschickter C. F., Lewis, D., and Hartman, C. G.: *Tumors of the Breast Related to the Oestrogen Hormone*. *Am J Cancer* 934, 836

Gynecomastia, virginal hypertrophy and fibro-adenoma of the breast are quite similar pathologically. They all show periductal and duct-stroma hypertrophy and hyperplasia of the epithelial lining and begin in the pre puberty period. They are considered by the authors as variations occurring in response to the ovarian hormone, oestrin.

Gynecomastia was produced in male monkey by the injection of from 1,000 to 3,000 rat units of oestrin.

Prolonged and uninterrupted stimulation by oestrin is more effective than number of small repeated doses.

During the pre-puberty stage (from the tenth to the fifteenth years of age) the female breast is under constant stimulation by numerous ripening and atretic follicles in the ovary which secrete oestrin or theelin and frequently presents irregular thickened areas.

Most fibro-adenomata have their onset during the same period, though not noted clinically until later. They show the same hypertrophy of the stroma without acini formation. If they grow rapidly there is usually proliferation of loose embryonic connective tissue surrounding the epithelial lining, the so-called intracanalicular myxoma.

Some fibro-adenomata develop later in life. Their formation may begin during pregnancy or their growth may be stimulated by pregnancy during which condition menstruation is absent and the concentration of oestrin is increased. They have never been known to begin after the menopause. Once formed, they do not involute under the influence of menstruation.

On analyzing fibro-adenomata, Geschickter found that it contained forty five times as much oestrin as the normal hog ovary. It is evident, therefore, that

fibro-adenomata have a marked ability to concentrate the hormone.

Cystic disease of the breast is most common in childless women during the period of life when the level of ovarian hormones changes repeatedly with each menstrual cycle. It shows hypertrophic changes in the duct epithelium similar to those occurring in fibro-adenomata. It may appear also in fibro-adenomata of long standing.

Virginal hypertrophy results from an abnormally high oestrin content of the blood. Fibro-adenoma is due to increased amounts of oestrin in the blood acting on a hypersusceptible tissue which has the capacity to concentrate the hormones at the site at which the tumor develops. In cystic disease the breast is subject to similar hyper-stimulation by oestrin, but the effect, which is not so pronounced, is transient, recurring with each menstrual cycle, and is complicated or diminished in involutional changes accompanying each menstruation.

During active sex life the tendency of increased oestrin stimulation is to cause subinvolution and cyst formation. As the menopause is approached the involution changes are exaggerated and spontaneous cure of cystic disease may result.

Experimentally, Geschickter has been able to produce microscopic changes resembling cystic disease, but no cysts, by repeated injections of oestrin made at intervals.

Fibrosarcomata are tumors showing all grades of malignancy, usually arising from pre-existing fibro-adenomata, and most always appearing at the menopause. At the menopause there is a marked rise in the secretory activity of the anterior lobe of the pituitary gland. This suggests a synergistic relation between the hormone of the anterior lobe of the pituitary gland and oestrin.

In the diagnosis of a doubtful tumor, determination of the oestrin level of the blood (Frank method) may be of value. Softening of gynecomastia has been obtained by repeated injections of prolactin, the milk producing hormone. Geschickter hopes for comparable results in fibro-adenomata.

HARRY C. SALTZSTEIN, M.D.

Overholt, R. H., and Eckerson, E. B. The Treatment of Cancer of the Breast and the Results of Operation. *New England J. Med.*, 1934, 211: 703.

The authors present an analysis of 719 cases of lesions of the mammary gland which were admitted to the Lahey Clinic in the period from 1923 to 1933. They emphasize the importance of very early diagnosis of cancerous and precancerous growths by routine early removal and microscopic examination of all mammary tumors and lumps. They have found that studies of front and profile photographs of breasts are of material aid in the recognition of early masses. The relation of palpable axillary lymph nodes to operability is discussed. The authors have decided that patients showing no involvement beyond the breast and axilla should be treated by radical mastectomy.

In chronic cystic mastitis they excise any discrete palpable tumor and examine it histologically. In 12 per cent of the cases of this condition in their series there was evidence of intraductal hyperplasia, which is regarded as a precancerous condition.

Simple mastectomy is advised for all cases of sanguinous discharge from the nipple in which an intraductal papilloma cannot be demonstrated. Thirty per cent of patients with a bloody discharge have been found to have carcinoma.

In the authors' cases all benign tumors and cysts are excised and examined histologically.

Routine postoperative irradiation is employed in all cases of breast cancer, and metastases and recurrences are heavily irradiated.

The various breast lesions in the cases reviewed are classified with regard to type and frequency, and the results obtained at the end of five years in 62 cases in which operation was performed for carcinoma are tabulated and discussed. The authors find no striking difference in the degree of malignancy of growths in young and older patients.

JAY E. TREMAINE, M.D.

Fox, S. L. Sarcoma of the Breast. *Ann. Surg.*, 1934, 100: 401.

The author suggests a classification of mammary sarcomata based on histological and anatomical features which can be used by the surgeon as well as the pathologist. He divides the tumors into the following four main groups: fibrosarcoma, neurogenic sarcoma, lymphoid and myeloid sarcoma, and non-indigenous tumors.

Fibrosarcoma may originate from the interlobar connective tissue. Sarcomata of such origin are similar to those seen in the fascial sheaths of the skeletal muscles of the body. They are solid tumors which may undergo cystic degeneration and are often encapsulated. Fibrosarcomata of another type are derived from pre-existing fibro-adenomata. Histologically these tumors resemble closely sarcomata of the fascial type except that they show numerous groups of acini and lobules. Because of their benign origin many of them are encapsulated. The third and most common type of fibrosarcoma is the serocystic sarcoma of Brodie which is secondary to an intracanalicular fibromyxoma. In this tumor there is a proliferation of the intralobular connective tissue which projects in papilla-like masses into the ducts, compressing the latter into narrow epithelial strands.

The sheaths of nerves entering the breast may give rise to sarcomata of a very malignant type. Tumors of such origin usually grow rapidly. They are very invasive, destroying the breast as they advance. The melanotic sarcoma and the perineural fibrosarcoma belong to this group.

Lymphoid and myeloid sarcomata arise about lymphatic plexuses and aggregations of lymphocytes within the breast or about outlying glands. The myeloid sarcomata consist of round cells which have more cytoplasm and larger nuclei and are lighter



staining than those of sarcomata of the lymphoid type. These are undoubtedly related to similar tumors of bone-marrow origin.

Among the author's cases of mixed and non-indigenous tumors of the breast there are ten of giant-cell tumor, one of osteogenic sarcoma and one of liposarcoma. The perithelial angiosarcoma and pseudosarcoma are excluded from this group.

Fox reviews sixty cases of sarcoma of the breast. The patients ranged in age from thirteen to seventy-five years, but the greatest number were between the ages of forty-six and fifty-five years. Only two of them were males. All except four gave a history of tumor of the breast. Five gave a history of trauma and twenty-two a history of pain and rapid growth of the neoplasm. The length of time the tumor had been present ranged from one day to nineteen years. In none of the cases except those of Group 3 was metastatic involvement of lymph glands demonstrated.

In discussing the diagnosis the author says that, except in cases of lymphoid and myeloid sarcoma, involvement of lymph glands is suggestive of carcinoma. Especially in the absence of metastasis to lymph glands, large bulky tumors are very likely to be sarcomata. In the author's series of cases there were forty-two of fibrosarcoma, seven each of neurogenic, lymphoid, and myeloid sarcoma, and four of non-indigenous tumors.

Irradiation offers little except in cases of lymphoid and myeloid sarcoma which are radiosensitive. However, pre-operative irradiation is advocated because it is impossible to distinguish the radiosensitive from the radioresistant forms. If the tumor becomes reduced in size very rapidly under irradiation, lymphosarcoma should be suspected.

Operation is the treatment of choice. Subcutaneous extension occurs to the pectoral fascia rather than to the axillary glands, both pectoral muscles and fascia should be removed. Axillary dissection may be omitted. Enucleation or excision should not be performed even if the tumor is encapsulated as extension of a sarcoma frequently occurs along the blood vessels through the capsule.

In general, sarcoma of the breast has a better prognosis than carcinoma. Sarcoma secondary to a benign tumor has a better prognosis than primary sarcoma, and fibrosarcoma a better prognosis than neurogenic sarcoma. In cases of fibrosarcoma the chances of cure are slightly higher for fibro-sarcoma than for sarcoma of the fascial type.

EARL O. LATTICE, M.D.

### TRACHEA, LUNGS, AND PLEURA

Foster J. M. J. and Frey D. The Treatment of Acute Traumatic Hemothorax. *Ann. Surg.* 934, 99-107.

The authors present a conservative method of treating acute traumatic hemothorax by which septic complications are avoided and the time of hospitalization is decreased by half. The procedure

consists in the simultaneous aspiration of the blood and the introduction of enough air to raise the intrapleural pressure to +7 cm. of water or above. The aspirations are begun immediately and repeated until all of the blood has been removed and replaced by air. Their number and frequency are determined by the findings of roentgenological examination for fluid and further bleeding.

The treatment described is of value in all cases except those in which a large blood vessel has been severed with resulting fatal acute exsanguination. In cases in which only smaller vessels have been injured, it prevents further hemorrhage and the blood lost may be re-injected. Collapse of the lung is maintained to a degree sufficient to allow healing of the injured lung tissue. The authors re-expand the lung gradually. In the case reported in this article re-expansion of the lung was begun on the fifth day and was complete within three weeks. The patient was discharged from the hospital thirteen days after his admission.

MIRAS JOHANNES, M.D.

HARRIS, H. J. Organic Foreign Bodies in the Bronchi. The Reaction of Lung Tissue in Rabbits. *Arch. Otolaryngol.* 934, 90-149.

The author introduced various solid organic foreign bodies into the bronchi of rabbits and after certain periods of time killed the animals and examined the lung tissue. The gross appearance of the lungs varied considerably according to the objects introduced, the manner in which the bronchial obstruction occurred, and the length of time the bronchus was obstructed. The most intense reaction was noted in lungs into which peanuts, bark of the pepper tree, or popovers had been introduced. The seeds of citrus fruits, grapes, and a tamarind caused moderate reaction. The least reaction was produced by the bark of the eucalyptus tree and castanopsis seeds.

Histological examination of the tissues showed that the response was progressive and consisted of exudation and proliferation occurring simultaneously. The exudative reaction consisted of the pouring out of large, swollen, irritated septal cells into the pulmonary alveoli to form an inflammatory alveolar exudate. The proliferative reaction consisted of the multiplication of cells lining the alveoli. The reaction increased each day until the pulmonary parenchyma lost its normal structure. The area of exudate was limited to the immediate neighborhood of the larger bronchi and extended outward. The rapidity of this expansion was apparently in direct proportion to the degree of the irritation.

The secondary change in the lung was alveolar localized, never a lobar pneumonia. It occurred on the third and fourth days in lungs containing the most irritating foreign bodies. The vascular change was uniformly that of an obliterating arteritis from a foreign body that caused a marked reaction. The proliferative changes in the endothelial lining of the blood vessels brought on, successively, intarction and focal necrosis of the pulmonary parenchyma.

Frank capillary hæmorrhage in the alveolar wall and, to some extent, hæmorrhage in the alveoli was found in lungs containing pop-corn, the bark of the eucalyptus tree, watermelon, grapefruit, and orange seeds, and peanuts.

Similar changes were present in the opposite lung which contained no foreign body.

In the author's opinion, the primary cause of drowned lung is a too rapid and excessive outpouring of mucus and exudate in the presence of a decrease in, or loss of, the cough reflex.

EARL O. LATIMER, M.D.

Sargent, E., and Mamou, H. Cases of Pulmonary and Thoracic Mycosis (A propos de quelques cas de mycoses pulmonaires et thoraciques) *Presse méd.*, Par., 1934, 42: 1497.

The clinical manifestations of pulmonary mycosis are varied and numerous and may suggest such conditions as tuberculosis, syphilis, cancer, abscess and suppurating cyst. In a case of aspergillosis reported by the authors with Gaucher and considered originally to be uncomplicated, the presence of a complicating tuberculosis was eventually discovered. To rule out complicating infections in cases of mycosis all resources must be employed including inoculation of a guinea pig to eliminate tuberculosis. Various cutaneous and serological reactions have been devised, but their interpretation is often difficult. In some cases it is necessary to rely on clinical observations and the response to treatment with iodides.

The first case reported by the authors was that of a previously well woman thirty-two years old who sought treatment for severe hæmoptysis and a purulent expectoration. A roentgenogram showed in the left parahilus region a cavity containing air and fluid. This was believed to be of tuberculous origin, but no bacilli were found. Artificial pneumothorax was without benefit. When the patient was first seen by the authors two years later the thoracic condition was unchanged and there was a history of the appearance of lesions on the lower extremities several months previously. The lesions consisted of cutaneous nodules which, when incised, yielded a gummy exudate. Bacteriological examination of a lesion which still remained on one foot over the tendon of Achilles was negative. The Wassermann test was likewise negative. A mycotic infection being suspected, intensive iodide treatment was given. This effected a complete cure which was maintained for three years. Recently there was a relapse which was apparently favored by secondary infection and permanent anatomical changes in the lung. Because of the skin lesions the etiological agent was believed to be the sporotrich.

The author's second case was that of a student who presented a florid skin, a generalized lymphadenopathy, and an extremely large spleen. The lymph nodes were small, firm, and painless. Physical examination was otherwise entirely negative and there was nothing in the history to explain the

splenomegaly. Because of the huge proportions of the spleen, splenectomy was done. The spleen weighed 2 kgm. On microscopic examination it showed a sclerosis with Gandy-Gamna nodules which are regarded by some as mycelial formations. After an interval of perfect health the patient began losing weight and appetite and developed night sweats, a cough, and an afternoon fever. No tubercle bacilli could be demonstrated in the sputum. Roentgenograms showed evidence of consolidation in the base of the right lung. From the sputum, histomycetes were isolated and identified by culture. Intensive iodine therapy resulted in clinical and roentgenological improvement approaching cure.

The authors report also two cases of thoracic (non-pulmonary) actinomycosis which for a time had been treated unsuccessfully as tuberculosis and in which iodine therapy led to rapid cure.

ALBERT F. DE GROOT, M.D.

Debré, R., and Gilbrin, E. Gas Cysts of the Lung and Bronchiectasis (Sur les kystes gazeux du poumon et les bronchiectasies) *Presse méd.*, Par., 1934, 42: 1113.

Gas cysts of the lung were for a long time regarded as curiosities of no general clinical or pathological interest, but recent studies of such cysts have added much to our knowledge of the common disease, bronchiectasis.

The essential clinical feature of gas cysts is dyspnea which occurs in paroxysms during the first few weeks, months, or years of life and less commonly at an advanced age. The younger the patient the more violent are the attacks. Previous to the onset, the patient presents the picture of good health, as is often the case in the presence of congenital anomalies in other parts of the body. The latency of congenital anomalies is explained by their slow evolution. The symptoms caused by gas cysts of the lungs call attention immediately to the thorax and examination reveals physical signs which are identical with those of pneumothorax, namely, hyperresonance, absence of breath sounds, and displacement of the mediastinum. The roentgenogram discloses the nature of the condition, showing absence of collapse of the lung and the presence of rounded clear areas surrounded by dark bands which give them a rounded or polycystic outline. The clear areas are traversed by the shadows of vessels or cyst walls.

The evolution of the cysts is variable as is indicated by the variations in the clinical picture. Frequently the cysts remain stationary and the symptoms are more or less latent. Again, the cysts may enlarge progressively, causing disturbances eventually incompatible with life. When they are of large size from the beginning, the result is stillbirth or very short survival. Other possibilities are rupture into a large bronchus, the fusion of several cysts, and suppuration.

The structure of the walls of the cysts reveals their origin, all of the elements constituting the normal

bronchus being found. The formation of the pouch appears to be brought about by a hypoplasia of the elastic tissue and, more important, a hyperplasia of the bronchial wall with the formation of ventral actin or bronchial buds instead of the alveoli which would develop under normal conditions. Vascular deformities occur in the form of telangiectases.

According to the authors' theory of the relation of bronchiectasis to gas cysts, an individual with a latent or frangible form of cystic disease of the lungs develops a pneumonitis which precipitates the symptoms and the physical signs of bronchiectasis. The authors believe that only in this way is it possible to explain the large bronchiectatic cavities which develop in children after such brief diseases as scarlet fever and influenza, and their frequency in the absence of a history of serious pulmonary disease. As sequel to chronic bronchitis the disease is rare. According to the authors' theory the congenital cysts which are often incompatible with life are monstrous forms of bronchiectasis which is the basis of the clinically well-known and not infrequent bronchiectases.

ALBERT F. DE GOWAT, M.D.

Rienhoff, F. Jr., and Brylson, E. A. The Surgical Treatment of Carcinoma of the Bronchi and Lung. *J Am Med Ass* 934, 95.

The authors describe a technique they have developed for pneumonectomy and report two cases in which it was used successfully. Before the operation is performed, artificial pneumothorax is induced for two purposes: (1) to render the patient accustomed to breathing with only one lung, and (2) to enable him to become adapted to the altered conditions of intrathoracic pressure that exist during and after the operation.

The hilus of the lung is approached through an incision in the anterior thoracic wall and is completely exposed so that anatomical dissection may be performed carefully. The pulmonary artery and veins are ligated independently. As these vessels lie for the most part ventral to the main primary bronchus, they are cared for at the beginning of the operation to prevent excessive loss of blood. Early ligation of the veins is of advantage also because it decreases the danger of air embolism and the spread of metastases by way of the blood stream. The approach to the operative field through the third intercostal space anteriorly permits dissection of the lymph glands of the hilus and of the posterior mediastinum.

The bronchus is closed by cutting the cartilage ring at several points in its circumference and suturing the mucosa and wall separately. The authors have found that cauterization of the bronchus is apt to cause sloughing.

The authors believe that thoracoplasty is unnecessary. They state that preservation of the normal thoracic cage is an important factor in the compensatory restitution. The thoracic cage serves somewhat as a anchor to which the heart and mediastinum are attached by broad bands. Part of the remaining

pneumothorax cavity becomes filled by the gradual compensatory expansion of the remaining lung and the rest becomes gradually obliterated by the formation of multiple fibrous bands.

EARL O. LATTING, M.D.

Monod, R. and Desbordes J.: Single-Stage Lobectomy with Open Pleura (La lobectomie, la pleure ouverte, en un temps). *Bull et mem Soc nat de chir* 934, 60, 908.

The authors prefer lobectomy to the century pneumonectomy of Graham, the fragmentary pneumonectomy of Baumgartner, and the consecutive pneumonectomy of Coqueliot as the latter procedures limit exploration of the thorax, are often incomplete and are generally insufficient when the lesions are multiple or disseminated as in bronchiectasis.

In describing the technique of lobectomy they discuss three major problems, viz. the closure of the pedicle, the treatment of the pleura, and the obliteration of the remaining cavity. They trace the experimental and clinical developments in the solution of these problems briefly from 1885 up to the present time, stressing particularly the advances which have been brought about by the German and American schools.

They report four cases in which lobectomy was done. Two of the patients died. The autopsy findings and the cause of death in the fatal cases are discussed.

Following the case reports the authors refer briefly to their experimental studies which have proved the feasibility of lobectomy and even of complete pneumonectomy.

The report is profusely illustrated and is discussed by PROUST, MAZET, and MOUTON.

NATHAN A. WORMACE, M.D.

Petrén, G.: The Problem of Severe Cerebral Symptoms After Operations on the Pleura or Lung (Das Frage schwerer cerebraler Symptome bei Operationen an Pleura oder Lunge). *Acta chirurg. Scand* 934, 74.

Petrén reports three cases in which cerebral symptoms developed after an operation for empyema and pulmonary suppuration, and discusses arterial air embolism as a causative factor.

In his first case the symptoms developed following an attempt at the localization of a lung tumor by aspiration with needles after the presence of adhesions had been established by the usual technique. On withdrawal of the needle, the patient suddenly looked ill, the pulse became weak, and there was a temporary loss of consciousness. Hemiplegia and facial paralysis then developed on the left side and speech was impaired. Later convulsions occurred, and twenty hours after the operation the patient died. Postmortem examination revealed a small abscess the size of a walnut, in the right lower lobe, and basal empyema. The blood pus. Examination of the brain yielded no explanation of the severe cerebral symptoms.

## SURGERY OF THE CHEST

The second case was one of empyema. Following drainage, the patient became pale, perspired freely, developed a hemiplegia on the right side, and became blind, but recovery resulted after several hours. The eye grounds were found normal. Examination of the visual fields disclosed a left homonymous hemianopsia in the lower quadrants. Later, the visual fields became normal.

In the third case there was an empyema cavity with multiple bronchial fistulae and bands and strands of tissue. Following ligation and severance of the bands, the patient lost consciousness, the pupils failed to react, and there was a change in the respiration. After closure of the eyes five hours later re-examination of the eyes revealed normal eye grounds, and a left homonymous hemianopsia. Subsequently improvement occurred.

These phenomena have been attributed to pleural reflex, pleural shock, epilepsy, and eclampsia. When Forlanini, in the nineteenth century, advocated artificial pneumothorax for the treatment of pulmonary tuberculosis similar complications were reported. Brauer concluded that sudden death associated with such phenomena is due to air embolism. According to others reporting fatal cases with these symptoms, changes have been found in the brain when death did not result immediately.

On the basis of his own cases and the cases reported in the literature the author concludes that air embolism is the most probable cause of the cerebral symptoms. In 1921 Schlapper expressed the opinion that indurated lung tissue lends itself to this accident as the veins in fibrotic tissue stand open because of the adjacent scar tissue.

WILLARD VAN HAZEL, M.D.

# SURGERY OF THE ABDOMEN

## ABDOMINAL WALL AND PERITONEUM

Pampari, D. A Case of Multiple Ventral Hernia—  
Strangulated Umbilical Hernia (Su di un caso di  
ernia ventrale multiple, ernia dello Spigolo  
del di chir 934, 17 6 9

The article contains illustrations and is followed  
by bibliography  
M. E. Moxam, M.D.

Bardecco, N. Occult Epigastric Hernia (Su la ernia  
epigastrica occulta) *Riv di chir Pat* 934, 43  
539

Pampari reviews the literature Spiegel's hernia.  
Opinions differ as to the relative importance of the  
various causative factors because of the rarity of  
the condition (only eighty-eight cases have been  
reported) and because most of our knowledge re-  
garding hernia of this type is based on observations  
made at operation. The majority of those reporting  
such hernia have attributed great importance to the  
vascular foramina in Spiegel's line and an anomaly  
of the perforating branch of the inferior epigastric  
artery. According to others, the lacunae at the point  
of union of the muscular and ponsurotic fibers of the  
transversalis are of greater importance. According  
to a third group, the chief factor is the dislocating  
action on the sponserotic fibers of accumulations  
of peritoneal fat.

The author's case is of special interest because of  
the association of an extremely large umbilical  
hernia with three large Spiegelian herniae. All of the  
herniae were irreducible. The patient was a woman  
fifty-two years of age. The large umbilical hernia  
had been present for many years. At operation,  
umbilical sac was resected.

According to the operative, autopsy, and histo-  
logical findings, the abdomen was divided into a  
deep and much reduced cavity—the true abdominal  
cavity—and a much larger sacculated, subcuta-  
neous portion representing the hernia. The former  
contained the duodenum, the first part of the ileum,  
and the last half of the large intestine. The rest of  
the bowel had escaped through the umbilical ring  
and the foramina in the region of Spiegel's line on  
the right side. The first of the ventral hernia com-  
part of the ileum and the cecum and the last  
portion of the ascending colon. Apparently one  
hernia occurred through vascular opening, while  
formation of the two others was favored by disloca-  
tion of the ponsurotic fibers or by congenital  
lacunae. In Pampari's opinion the peritoneal fat  
is the most important factor in the formation of such  
hernia as in its gradual growth it enlarges the vas-  
cular foramina and exercises separating action on  
the sponserotic fibers.

Microscopic examination of the abdominal wall  
showed advanced muscular trophy with fibrous  
replacement and marked fatty infiltration.

By occult epigastric hernia, the author means  
the small hernia which occurs in the midline between  
the xiphoid and umbilicus, can usually be felt only  
with difficulty or not at all, and are often the cause of  
abdominal symptoms out of proportion to their size.  
His reports eleven cases with major gastro-intestinal  
disturbances which were completely cured by exci-  
sion of the hernial sac followed by repair of the defect.  
In five of these cases the symptoms were at first  
ascribed to ulcer of the stomach in one, to carcinoma  
of the stomach in one, to appendicitis and in one, to  
intestinal obstruction. In four there was severe  
hematemesis. In only five was the hernia recognized  
before operation although it was sought for carefully  
in all. In none of them was any pathological change  
found in the gastro-intestinal tract at laparotomy.

The hernia varied from the size of a pea to that of  
an olive. Apparently none of them was a so-called  
proliferated hernia as all of them had a sac.

In discussing the difficulty of finding the her-  
nia on clinical examination, the author advises  
examination of the patient in many different posi-  
tions, with careful palpation along the midline be-  
tween the xiphoid and umbilicus. Frequently only  
tender spot can be found. He emphasizes the fre-  
quent similarity of the symptoms caused by such  
hernia to those of ulcer of the stomach. In most of  
the cases he reports the pre-operative diagnosis was  
based on clinical findings not supplemented by those  
of roentgen examination.

MAX M. ZIMMERMAN, M.D.

## GASTRO-INTESTINAL TRACT

Gray, H. K. Balfour D. C., and Kirklin, B. R.  
Cancer of the Stomach. *Am J Cancer* 934,  
349.

This article was prepared at the request of the  
American Society for the Control of Cancer as one of  
a series of monographs on subjects of interest and  
importance to those engaged in the diagnosis and  
treatment of cancer.

The authors call attention to the fact that cancer  
of the stomach causes more deaths than cancer of  
any other organ and in the majority of cases seen by  
the surgeon is too far advanced to permit complete  
removal of the involved tissue. In spite of the pres-  
ence of the medical profession and laymen,  
experience has shown that a malignant process

## SURGERY OF THE ABDOMEN

in the stomach may be cured if it is diagnosed early in its growth. Roentgenological diagnosis has made possible the recognition of cancer of the stomach in its earliest stages, and such an examination should be insisted upon for every patient with symptoms suggesting a pathological gastric change which do not subside rapidly under treatment with the usual remedies. The authors believe that as surgical removal of the lesion offers the only possibility of permanent relief, exploration is warranted in any case of cancer of the stomach unless the condition is clearly incurable because of distant metastasis or unless the lesion itself is definitely inoperable as evidenced by the findings of roentgen examination.

The authors review the etiology of the condition, the age and sex incidence in several large series of cases, and the many methods which have been suggested for the diagnosis of gastric cancer. They state that the most outstanding advance in the diagnosis is roentgen examination.

The discussion of the treatment includes the indications for operation, the pre-operative treatment, the anaesthesia for operation, the operative technique, and the postoperative care. The authors believe that the mortality of partial gastrectomy for cancer should be close to 10 per cent. They discuss the clinical and pathological factors affecting the prognosis and conclude that the three factors most important in decreasing the possibility of long survival after operation are involvement of the lymphatic structures, serosal involvement, and high-grade malignancy.

The X-ray diagnosis is discussed by Kirklín Bohmansson, G. On the Technique of Partial Gastrectomy (Billroth I). *Acta chirurg Scand*, 1934, 75 221

The author advocates resection by the Billroth I method as a routine operation for gastroduodenal ulcers. In cases without acute complications its mortality is less than 4 per cent. Bohmansson performs it under local anaesthesia with splanchnic and vagus block from a median incision. Important factors in the technique are observance of the anatomical conditions, gentleness in the resection of the vessels, muscles, and nerves in the tissues edges, avoidance of the use of clamps on the tissues left, intestinal incision with diathermy, extensive mobilization of the duodenum in cases of duodenal ulcer, and care to avoid making a too-wide anastomosis.

The article is concluded with a brief review of the indications for the operation and the usual complications.

Costa, G. Late Intestinal Stenoses Secondary to Hernial Incarcerations (Le stenosi intestinali tardive secondarie agli incarceramenti erniani). *Arch ital di chir*, 1934, 37 45

Costa sums up his theories regarding late intestinal stenosis secondary to hernial incarcerations, reviews clinical and experimental studies of the condition,

and reports eight cases in which he operated successfully. The number of reported cases does not exceed fifty. The decrease in the frequency of the condition in recent years is attributable to more frequent performance of the radical operation for hernia and early intervention in cases of strangulation.

The origin of this clinical entity always lies in an error in judging the biological condition of an intestinal loop which, after temporary strangulation, is replaced in the abdomen at operation or by manual reduction. The mistake is often unavoidable because the changes are not distinct and the loop does not present a uniform or pathognomonic appearance. However, the mechanism of the stenosis is always the same. The lesions begin in the mucosa, which undergoes massive ischaemic necrosis. In this process the action of the constriction ring is most important. It stimulates the muscular layers to contract, thus throwing the mucosa into folds and cutting off the blood supply at the base. The lesions extend progressively toward the exterior although the mucosa is transformed into a kind of sequestrum with a line of demarcation which protects the outer layers and the peritoneum. If operation is performed at the stage when the process is limited to the mucosa, the lesion will escape the most careful observation. Therefore the condition underlying the late stenosis is a temporary strangulation which is compatible with a slow cicatricial reconstruction.

The clinical course is progressive. It is divided into a prodromal stage characterized by vague disturbances, diarrhoea, and intestinal hæmorrhage, which corresponds to the degenerative histological phase, and a terminal stage, in which the stenosis, partial or complete, is established. A free interval of apparent cure intervenes between the replacement of the loop and the onset of the premonitory symptoms. This interval, which in the reported cases varied from a few days to fourteen years, is pathognomonic. In discussing the prevention of the condition the author emphasizes the importance of caution during ordinary herniotomies. He states that while there is no decisive evidence of the potential vitality of a loop of intestine, a sign of reduced vitality, which has not been sufficiently appreciated, is a total, massive infiltration of the intestinal walls.

M E MORSE, M D

Ladd, W E, and Gross, R E. Intussusception in Infancy and in Childhood. A Report of 372 Cases. *Arch Surg*, 1934, 29 365

The authors report on 372 cases of intussusception from the Children's Hospital, Boston. To show the improvement in the treatment of this condition, the results obtained in the twenty-year period from 1908 to 1927 are compared with those obtained in the five-year period from 1928 to 1932. Of the 90 cases treated in the last five years, resection was done in only 2 (2.2 per cent), whereas of the 282 cases treated in the previous twenty years, resection was done in 28 (10 per cent). The reduction in the frequency of resection was due to the following 3 facts:

In the last five years patients were referred earlier for treatment.

The surgeons became somewhat more bold in attempting to reduce intussusceptions which previously were regarded as irreducible.

3. Experience showed that the intestine which was badly discolored and damaged after reduction was frequently viable, whereas formerly such an appearance would have led to resection.

Eighty-seven per cent of the patients were under two years of age and 70 per cent were between the ages of four and eleven months. Sixty-one per cent were boys.

The important and most frequent symptoms were attacks of abdominal pain, pallor, sweating, vomiting, and the passage of bloody stools. The prominent physical findings were shock, dehydration, a palpable abdominal mass, the passage of blood from the rectum, and possibly mass palpable by rectal examination. Roentgen observations in the ileocolic variety were characteristic, but roentgen study was not necessary in the average case of acute intussusception.

The usual treatment was operative reduction. Resection was done only when the attempt at reduction failed. Of the 30 resections, only 2 were successful.

The mortality in all cases showed a continuous downward trend from 59 per cent in the period from 1903 to 1913 to 4 per cent in the period from 1913 to 1931. In the last five years 60 cases were seen within thirty-six hours after the onset of symptoms. In this group operation was performed with no mortality.

HEINRICH F. TROSTOV, M.D.

PETERSON, L. Adhesion of the Terminal Ileum and Descending Colon to the Adherent Terminal Ileum. An Anatomical, Clinical, and Clinicostatistical Study (Beträgg rör Känslan hos Ileum terminalis fixerat ned till terminalis ilei). En anat. och klin. studie, klistade och klistade-statistiska Studier. *Acta chirurg. Scand.* 934, 75 Suppl. 3.

The author believes that in most cases of adherent ileum the condition is congenital anomaly or variant of development. During the physiological secondary period of adhesion the terminal ileum, the caecum, and the ascending colon come to be pressed to the right renal or suprarenal region. It is characteristic of such cases that the most caudally situated part of the meso-ileum is missing or for a longer or shorter distance lies lower than normal and limits the free mobility of the intestine.

According to Peterson study proportionate increase in these cases seems to occur after birth and to be most pronounced in the transition period from youth to middle age. However this increase may depend, in part at least, upon such folds and adhesions as seem to be physiological in children and become pathological later in life. In an inconsiderable number of cases the condition may be the result of trauma, thrombosis, chronic mesenteritis, or an acute inflammatory process in the ileocecal region. Appendicitis seems to be of little or only slight im-

portance. The condition is encountered more often in males than in females. In the fetus or newborn infant no scars are found in the abnormally low meso-ileum or adjacent intestine. Later in life these parts are transformed by scars. In cases of Desc's of the fixed terminal ileum these changes are extreme, although, even with this occlusion, scars are sometimes absent. A membrane similar to Jackson's membrane seems sometimes to take part in the cicatricial transformation.

According to the author's anatomical and embryological findings, the terminal ileum and sigmoid colon may be attached to their surroundings or directly to each other and, in addition, may be fixed to the dorsal abdominal wall in the right iliac fossa even in the absence of demonstrable scar transformation. The author's findings support Broen's hypothesis that the physiological secondary fixation of the intestine is due to the general adhering tendency of the serosa under certain conditions rather than to an adhesive tendency inherited in the germinal layer which migrates from one part of the intestine to another. An innate adhering tendency between the ileum, caecum, ascending colon, and hepatic flexure does not seem probable. The author holds that the fixation of the proximal colon is not released in the later months of embryonic life, and that, accordingly, there is no third physiological affixing period for the intestine.

Peterson's statistical investigations on Terres' coeco-appendix types reveal a marked forming and deforming influence of the intestinal contents and activity on the coeco-appendix. A transformation of the fetal type occurs. This is probably most marked during the earliest years of childhood and becomes stabilized between the ages of eleven and twenty years although even later in life a slow change occurs in the direction assumed in childhood. The author is of the opinion that some of the periaependicular adhesions are fetal formations. He believes this to be true chiefly in the cases in which no acute progressing attacks of appendicitis attacks have occurred. A long sigmoid colon is found relatively often in fetuses in Karlsruhe.

Occlusions may be divided into a western European and an eastern European group. In Finland, the latter is found. They are characterized by frequent association with the forms of ileum which are due principally to congenital anomalies or variants of the intestine and mesentery but are often transformed in the course of years. These occlusions occur almost exclusively in males.

The adherent terminal ileum is often an important factor in the occurrence of volvulus of the ileum, twisted occlusion, and other forms of ileus in the terminal ileum. It frequently seems to contribute to the development of the adhesions with sigmoid flexure and sometimes to the occurrence of volvulus of the caecum.

The rarest adherent terminal ileum seems to occur in many countries. It is common in the eastern part of Finland and probably throughout that coun-

try. It seems to predispose to ileus in races with a more or less apparent admixture of Slavic blood. However, heavy physical labor and life under relatively unfavorable conditions are contributory factors. Ileus of the adherent terminal ileum occurs chiefly in men between middle and old age who are engaged in heavy agricultural labor.

The majority of persons with the condition suffer for some time with gastric and intestinal disorders, often in the form of a more or less pronounced obstruction of passage in the lower part of the small intestine. As a rule the onset is comparatively acute, but it occurs more often within a few hours or a day than as a hyperacute condition.

The typical acute attack indicates a quickly developing pronounced toxic state with the obstructed intestine lax and filled with fluid and rapidly slackening peristalsis. In rare instances intestinal gangrene has been found.

Operation should be done under lumbar anesthesia or, in the cases of seriously ill patients, local anesthesia. Both before and after the operation generous amounts of fluids and hypertonic sodium chloride solution should be given. After the operation the intestine must be well evacuated in the least fatiguing manner. The basic aims of operation are removal of the obstruction and provision for efficient postoperative evacuation of the obstructed intestine. Simple detorsion is sufficiently effective only if the afferent coil shows good peristalsis and vitality. In the absence of good peristalsis and vitality of the afferent coil, appendicostomy or a Witzel ileostomy should be done. If the wall of the ileum is fragile and relatively inactive, cæcostomy may be tried. In this procedure as well as in appendicostomy the fistular drain should be introduced into the afferent intestine through the coils of the colon and past the obstruction. If the condition is very toxic and a large part of the small intestine is bulging and lax, the formation of an axial artificial anus seems to be indicated.

The prognosis is unfavorable. In Finland the mortality in operatively treated cases has been reduced from 59.5 per cent in the period from 1915 to 1930 to 45.2 per cent in the period from 1931 to 1932. The danger of a secondary adhesional occlusion or of recurrence of occlusion by the adherent terminal ileum is not slight. When, after the operation, there are signs of a low obstruction in the small intestine, ileocolostomy or resection of the intestine should be considered.

LOUIS NEUWELT, M.D.

Dinnick, T. The Origins and Evolution of Colostomy. *Brit J Surg*, 1934, 22, 142.

Wounds of the bowels were recognized in remote antiquity. Even then it was noted that persons with bowel wounds sometimes survived when a faecal fistula was established and that in cases of strangulated hernia a cure sometimes resulted when an artificial anus was formed as the result of inflammation and sloughing. The anatomy of such openings was well known, and the afferent and

efferent loop and the spur were described by many ancient writers. Stabbing of the colon of a sheep or horse suffering from obstruction is a veterinary operation the origin of which is lost in remote antiquity. Pillore, a surgeon at Rouen, performed cæcostomy for cancer of the rectum. His patient, a wine merchant, died on the twenty-eighth day after the operation. Autopsy revealed that the colostomy was functioning perfectly without leakage into the peritoneal cavity. Death was caused by the previous administration of about 2 lb of quicksilver which, held up in a loop of jejunum, caused the loop to gravitate to the pelvis and thereby produced disseminated gangrene of the small bowel. The primary obstruction was due to a carcinoma of the rectum.

Colostomy may be said to have had its real birth when Duret in 1793 performed a successful left iliac colostomy in a case of imperforate anus in a child three days old. The patient lived to the age of forty-five years. With Duret began the history of colostomy. Duret antedated Callisen in the conception of lumbar colostomy. He made a very small incision and secured the bowel by a stitch in the mesocolon, thus preventing recession of the bowel. He noted the occurrence of prolapse and he used the anal canal as a channel for the administration of a colonic flushing. Surely, as the prophet says, "All knowledge is but a remembrance, and all discovery but a forgetting." Duret was professor of surgery at the Military and Marine Hospital at Brest, a humble and obscure naval surgeon. In 1797, Dumas reported to the Medical Society of Paris a case of imperforate anus. He did not operate in that case, but from the findings at autopsy he concluded that a colostomy on the left side would have been feasible surgically.

In 1797, Fine, surgeon in chief of the hospital of Geneva, performed a transverse colostomy on a woman sixty-three years of age after obstruction had been present for fourteen days. The operation was successful, but the patient died three months later and autopsy revealed a primary growth in the upper rectum causing complete obstruction.

The first colostomy in England was done in 1815 by Freer, a surgeon in Birmingham. Freer performed a left iliac colostomy for imperforate anus and the child lived three weeks, dying eventually of marasmus. In 1820, Pring, of Bath, a clever and resourceful surgeon, performed a left iliac colostomy on a patient who had had an obstruction from cancer of the rectum for twelve days. The patient survived. It was not until the time of Amussat, of Paris, that colostomy was rescued from the realm of occasional and heroic operations and advanced to its proper place in surgery. Amussat abandoned the longitudinal incision of Callisen and Duret and substituted a transverse incision 4 in long made midway between the last rib and the iliac crest and extended well back to the erector spinae and quadratus lumborum muscles. He fixed the bowel to the anterior angle of the wound by a suture and left the rest of the wound open. Lumbar colostomy was an operation well



suited to the pre-anesthetic and pre-asthetic times in which Amussat lived. Amussat's activities gave the operation an impetus which carried it successfully to the time of the younger Allingham. It became the operation of election and was practiced by all surgeons in Europe, England, and America. It will be remembered that Duret attached the mesocolon. This most effectively prevented collapse of the bowel and formed a good spur. In 1855 the necessity for a spur was definitely recognized. In 1883, Mayall advanced and stapled colostomy by his idea of passing a vulcanite rod through the mesocolon. The rod lay upon the belly wall and very effectively prevented recession of the loop of bowel. Two distinct ways of performing an abdominal colostomy are now recognized. One depends for its efficiency upon a spur—the method of Duret, Allingham, and others. The other consists in division of the bowel, closure and invagination of the distal end, and utilization of the free proximal loop in various ways. The use of this method led surgeons to careful study of the colonic blood supply. Many ingenious methods of operation have been devised to obtain sphincteric control of the anus.

JOHN W. NICHOLS, M.D.

Brandman, H. Appendicitis and Acute Inflammatory Abdominal Conditions in Scarlet Fever: A Report of Nine Cases and a Review of the Literature. *Arch Surg* 934, 20, 6.

Brandman reviews nine cases in which abdominal manifestations of scarlet fever were mistaken for the symptoms of acute appendicitis or pathological involvement of the right lower abdominal quadrant developed during the course of the exanthem. In addition, he cites thirty-four cases collected from the literature and several cases reported to him personally in which a pathological condition in the lower right quadrant of the abdomen was associated with scarlet fever.

The abdominal organs that may be involved are (1) the appendix, (2) the lymph nodes between the ileum and caecum, (3) the lymphoid patches of the ileum, (4) the lymphoid tissue of the caecum itself, (5) lymph nodes elsewhere in the mesentery and (6) the spleen.

When the presence of appendicitis is suspected during the course of scarlet fever, the possibility of spontaneous regression must be balanced against that of perforation and peritonitis and the condition treated in the same way as it would be treated in the absence of scarlet fever.

GEORGE A. COLLIER, M.D.

Brown, C. J. D. Deaths from Appendicitis. *Med J Australia* 934, 407.

In discussing the mortality in series of cases of appendicitis treated at the Alfred Hospital in Melbourne, Australia, Brown emphasizes certain causes of the present death rate. Chief of the latter is delay of treatment, for which both the patient and the physician are responsible. Brown says that diagnosis should be possible within twelve hours after the

onset of the condition, and with modern methods of communication and transportation there are very few patients who could not be operated upon within this time or at least within the first twenty-four hours, when the mortality is less than 1 per cent. The high proportion of atypical cases among those which are fatal and the occurrence of pelvic appendicitis and appendicitis in the aged should be borne in mind.

In late cases, the technique of operation is of great importance. Interference with the abdominal contents must be minimal and manipulation of the small intestine must be avoided. Paralytic ileus is largely the result of poor technique. A small incision, blind operating, unnecessary packing, rough handling of the bowel, and careless hemorrhoidal are the fatal technical errors. The author has found that drainage is not often required, and when necessary its usefulness ceases after forty-eight hours. He believes that the long continued retention of drainage material is never justified and definitely increases the complications.

JACOB M. MORA, M.D.

Achmatowicz, L. Sixty-One Cases of Volvulus of the Sigmoid and Observations on Their Surgical Treatment (*Sixante et un cas de volvulus de l'intestin sigmoïde et quelques observations sur leur traitement opératoire*). *Bull et mémoires Soc de chirurgiens de Paris* 934, 26, 372.

In the fifteen years between 1919 and 1934, 46 cases of mechanical intestinal obstruction were observed at the St. Jacques Hospital in Wilno, Poland. In 101 the obstruction was due to a strangulated hernia in 6, to volvulus of the sigmoid loop in 5, to adhesion loops in 31, to volvulus of the small intestine in 1, to intussusception and in 8, to volvulus of the caecum. Volvulus of the sigmoid loop is favored in Poland by the diet, which is very conducive to flatulence, consisting as a rule almost exclusively of vegetables and bread. However its development requires, in addition to the effects of diet, a mesenteric deformity allowing abnormal movement of the sigmoid. It is far more common in males than in females. The patients whose cases are reviewed by the author ranged in age from sixteen to eighty years, but the greater number were in the fifth decade of life. The tendency toward recurrence of the volvulus was very marked. In 16 of the cases reviewed there were a or more recurrences. Five of the patients had already been operated upon for the condition.

The first symptoms is almost invariably generalized abdominal pain. In the cases reviewed this, as of an increasing and decreasing type and did not become localized. In a large number of cases it was associated with vomiting. In almost all of the cases there was marked tympanites without the passage of gas or fecal matter by rectum. Rarely blood and mucus were discharged from the rectum. Occasionally the beginning of the attack was attended by the picture of severe shock. As a rule, however, the temperature and pulse remained normal. Examine-

tion revealed very marked unsymmetrical distention of the abdomen in the transverse diameter. This was especially noticeable under the costal margin. In the majority of the cases it is possible, by careful inspection, to observe the sigmoid loop filling and emptying, a sign first described by Obalinsky in 1889. This sign can be provoked by gentle percussion over the lower quadrant of the abdomen. The author regards it as a more or less reliable indication of vitality of the sigmoid loop as it is usually absent when the bowel is necrotic. Rectal examination is rarely of aid.

The treatment indicated is usually operative but in some cases conservative measures may be attempted first. The flushings described by Hegar and hot baths may be of value. The attempt may be made to pass a soft rubber tube to the obstruction, but this is definitely dangerous. In the cases reviewed, 24 of 36 patients subjected to this procedure were benefited, but 2 died, presumably from perforation. In 18 cases operated upon, necrosis of the sigmoid was found. The volvulus had reached 180 degrees in 12 cases, 360 degrees in 21, 450 degrees in 1 case, 720 degrees in 4 cases, 900 degrees in 1 case, and 1,020 degrees in 1 case.

The author operates under general anesthesia, after he has corrected the volvulus and before he closes the abdomen he evacuates the intestinal contents by means of a large rubber tube introduced into the rectum. In cases in which the bowel is necrotic he has found the mortality lowest when the necrotic segment is exteriorized and intra-abdominal manipulation is limited to the absolute minimum.

In conclusion he urges early operation.

WILLIAM C. BECK, M.D.

Lee, H., and Staley, R. W. **Inflammatory Strictures of the Rectum and Their Relation to Lymphogranuloma Inguinale.** *Ann Surg*, 1934, 100, 486.

The authors state that the specific intradermal test of Frei explains the apparent discrepancy between the number of men and women affected by lymphogranuloma inguinale. This test shows that the disease is common in women, but that in the female it is often represented by a stricture of the rectum and seldom by involvement of the inguinal lymph nodes whereas in the male the reverse is true. The site of the primary lesion and the lymphatic drainage of the external genitalia in the two sexes are responsible for the variation in the distribution of the lesions.

The lymphatic drainage of the glans penis and prepuce is primarily to the inguinal lymph nodes. These have connections with the iliac nodes above. An occasional lymph vessel leads directly through the femoral canal and abdominal muscles from the glans penis and prepuce to the iliac and hypogastric lymph nodes. A number of anastomoses are present between the lymph vessels of the glans penis and prepuce and the skin of the scrotum, and occasionally there is a direct connection with the anal region.

The skin of the scrotum drains chiefly to the inguinal region. The abundant connections of the skin of the scrotum with the anal region are of great importance as they indirectly connect the penis and the cutaneous lymphatic network of the anus.

The clitoris and vulva drain principally to the inguinal nodes. The lymphatics of the posterior portion of the vulva have extensive connections with the cutaneous lymphatic network of the anus. In both sexes there are many communications between the anal network of lymphatics and Gerota's nodes at the anorectal junction. The connections between the lymphatics of the posterior vaginal wall and anus are quite free.

From our knowledge of the lymph drainage it is understandable how involvement of the lymphatic tissue of the inguinal region or anus can cause elephantiasis of the external genitalia or stricture of the rectum, depending upon the degree and location of the involvement of the lymph channels. In the male the primary lesion is located chiefly on the glans penis and prepuce, this fact accounting for the frequency of inguinal bubo and the relative infrequency of rectal stricture. In the female, the primary lesion is thought to be located most often on the vulva or the posterior wall of the vagina and as the lymphatic pathways of these sites have abundant connections with the anal region, the complication of rectal stricture is to be expected.

Of the sixteen cases of rectal stricture reported by the authors, the Frei test was positive in fourteen. Eleven of the thirteen women and two of the three men were colored.

In discussing the factors to which rectal stricture has been attributed, the authors state that lymphogranuloma inguinale is by far the most frequent cause.

EARL O. LATIMER, M.D.

## LIVER, GALL BLADDER, PANCREAS, AND SPLEEN

Lozano, R. **Is There a Functional Specificity of Certain Regions of the Liver?** (Gibt es eine funktionelle Spezifität bestimmter Leberbezirke?) *Deutsche Ztschr f Chir*, 1934, 243, 52.

The relationships between the liver region and the region from which the portal vein takes its source, which have been described by Henschen, led the author and others to attempt to answer the question whether it is possible to demonstrate physiologically significant and definitely measurable functional differences between the two halves of the liver or the hepatic lobes corresponding to the anatomically demonstrated bilateral division of the portal vein and the other vascular branches. A dual function is suggested by the fact that a main stream from the stomach, the spleen, and the area of the inferior mesenteric vein runs laterally to the left in the portal vein and empties chiefly into the left half of the liver (this being possibly a sinistrotropic source stream) and a second main stream, fed from the small intestine and the ascending colon and therefore from

the superior mesenteric vein (possibly a dextro-tropic source stream) supplies itself to the right laterally into the right half of the liver. Moreover it is known that the left half of the liver is the most common site of secondary liver abscesses arising from dysenteric ulcers in the left half of the large intestine while the right half of the liver is the most common site of metastatic infections from perityphilitic abscesses or abscesses in the right half of the abdomen. Attention is called also to the fact that there are two liver halves which are topographically anatomically, and functionally independent of each other and divided from one another not by the hepatic suspensory ligament, but by the so called line of Cantlie, a line extending from the gall bladder to the hepatic vein which divides the liver into two parts of equal weight.

The formulation of a working hypothesis required the demonstration of definite, regionally fixed, functional areas in the liver by chemical analysis of the tissues with regard to their content of water, dry substance, nitrogen, and fat, and determination of the relationship of any functional differences to the zone of Cantlie. The author therefore analyzed (1) the livers of five normal dogs, (2) the livers of starved dogs, and (3) the livers of four dogs in which, by the artificial production of blood stasis, some of the lobes had been increased to twice their weight when they were free from blood.

These studies showed that while there are differences in the water, nitrogen, and fat content of the individual liver lobes, there are no definite anatomically determined functional differences between them. The line of Cantlie may well be considered the dividing line between the right and left vascular trees, but is not the dividing line between two functionally different halves of the liver.

The author compares his findings with the contradictory findings of Schell and attributes the frequently marked differences in the results of analyses made by previous investigators to differences in the amount of blood present in the individual liver lobes and the liver region, which is difficult to determine at autopsy. (H. Ullrich) HARRY A. SALAMANT, M.D.

Boudolles, A. J. and Andrus, C. V. Provoked Elimination of Gall Stones. (La élimination provoquée de los cálculos biliares.) *Rev. Inst. Soc. de Ciruj. de Buenos Aires* 1934 3 493

Although early operation has decreased the gross mortality of surgery of the biliary tract, the death rate still remains high in cases of serious biliary tract disease. Because of the particular fragility of patients with gall stones, there is a field for medical drainage in calculous obstruction of the common duct as a means of avoiding operation in certain cases.

The methods recommended by the authors are medical and mechano-surgical. The medical treatment consists of drainage by the Mélière-Lyon method. In the mechano-surgical treatment the authors have for several years successfully combined incisions

through the Kehr tube with the use of the duodenal sound. In the technique they employ the Kehr tube is placed off duodenum is given intravenously and atropin is given hypodermically. The duodenum is washed out with tepid water through the duodenal sound and 50 c.cm. of a 30 per cent solution of magnesium sulphate are instilled. Normal salt solution (from 500 to 1,000 c.cm.) is then allowed to run into the Kehr tube. It comes away through the duodenal sound, bringing with it mucus, detritus, and fragments of stone. This procedure has enabled the authors to verify and study the relaxing action of magnesium sulphate and atropin on the sphincter of Oddi.

The principal indication for medical drainage of the bile passages is the period of obstruction in cases of stones in the common duct. The authors have noted that a syndrome of common-duct obstruction precedes elimination of the stones by the natural route in all cases. They state that medical drainage should of course never be attempted in the presence of acute cholecystitis or hydrops of the gall bladder. In the majority of cases of common-duct stones in which it is used the elimination is complete. When expulsion of the stone is obtained in cases presenting the common-duct syndrome, operation need not be hurried. The further evolution of the case will indicate the course to be followed. As a rule the jaundice and infection of the biliary passages disappear rapidly and permanently.

Of a total of eighty cases of stones in the common duct, the authors succeeded in eliminating the stones through the intestine tract in 3 (3.75 per cent). Six of the patients required operation later, one succeeded in expelling the residual stones after operation, and the remaining six, after exhaustive medical treatment, have remained in good health for varying numbers of years. Several of the patients were elderly persons with cardiovascular disease, and some were in precarious condition from infection. The case histories are reported in detail with roentgenograms. (M. E. Moser, M.D.)

Mitchelson, O. Acute Pancreatitis. I. Severe Cases, With Special Reference to Their Conservative Treatment. (Pancreatitis acuta. I. Schwere Fälle, besonders hässlich über konservativer Behandlung.) *Arch. Chirurg. Scand.* 1934 75 373

The author states that improvement in our knowledge of acute pancreatitis consists almost exclusively of a better understanding of the etiological factors and the criteria for diagnosis. The treatment of the condition still remains almost exclusively surgical and the average case mortality of surgical treatment is still 50 per cent. Surgical treatment involves either the pancreas itself (incision into the capsule and drainage) or the bile ducts.

It is pointed out that there is no anatomical basis for an operation on the pancreas. The pancreas has no true capsule in the anatomical sense of the term. The structure is divided by a falciform into the pancreas is the peritoneum covering the organ, and an

incision through this peritoneal cover cannot relieve the secretory tension in the pancreas. The pancreas is made up of many small lobuli which are separated by thin septa of connective tissue. To relieve pancreatic tension it would be necessary to divide the thin layer of connective tissue covering each lobulus and that is impracticable. Moreover, the interlobular connective tissue septa are intimately connected with the glandular tissue which is always affected at the same time. An operation of this type is therefore apt to cause an increase rather than a decrease of the necrosis and intoxication. In addition, it is associated with a not inconsiderable risk of hæmorrhage and fistula formation.

Operations on the bile ducts are theoretically more logical. However, the systematic performance of such operations in recent years has failed to bring about a decided decrease in the case mortality, no doubt because the patients are in such poor condition that they are unable to stand any operation whatever.

Recently a few surgeons have adopted more conservative treatment, some of them postponing the operation until the shock stage has been passed and others postponing it until all acute symptoms have subsided and then operating for gall stones when these are found to be the cause of the acute pan-

creatitis or if the process goes on to abscess or cyst formation.

On the author's service during the last eight years, thirty-nine cases of severe acute pancreatitis have been treated conservatively. Of twenty patients who were extremely ill, being in a state of shock, only three died. Of the nineteen others, who were also very ill though not in a state of shock, none died. The diastase value usually ranged from 3,000 to 12,000. In only two cases was it under 2,000. Subsequent operation was performed only when the presence of gall stones was ascertained with certainty, and then not until from one to three weeks after subsidence of the acute symptoms.

The treatment which the author has adopted includes the following factors:

1 A plentiful intake of fluid (water, tea) by mouth as far as the vomiting will permit.

2 The subcutaneous and intravenous administration of 1 liter of physiological salt solution several times daily.

3 Stimulants and, frequently also, when the blood pressure is particularly low, ephedrin.

4 Peristaltics—enemas containing 2 c.cm of sen-natin once or twice daily and, in some cases, the intravenous injection of 1 c.cm of pituglandol once or twice daily.

# GYNECOLOGY

## UTERUS

Ducuing, J. The Treatment of Fibromata of the Uterus in the Absence of Pregnancy (*Le traitement des fibromes de l'utérus en dehors de la grossesse*). *Bull. Soc. d'obst. et de gynéc. de Paris* 1914, 24, 464.

This article is based on the author's experience in the treatment of over 300 cases of fibroma of the uterus by surgery and the treatment of over 300 similar cases by means of physical agents.

Ducuing says that fibromata of the uterus are more common than is generally assumed, but many of them do not cause symptoms. Occasionally they prolong menstruation without affecting the general health, and in some cases they cause symptoms of compression.

The treatment of uterine fibromata is not without danger. The mortality and morbidity are quite considerable even when irradiation is used. The author believes that radium, especially when it is placed within the uterine cavity, is more dangerous than the X rays. In one of his cases the intra-uterine introduction of radium was followed by death from septic pyemia. He states that fibromata should not be treated unless they cause symptoms.

Surgical treatment is indicated for all cases of fibroma in which the diagnosis is doubtful, cases of fibroma with a twisted pedicle or undergoing degeneration, cases of fibroma complicated by an infection of the uterus, and cases of fibroma complicated by an affection of the neighboring non-genital organs. The type of surgical treatment indicated depends upon the nature of the tumor.

Physical agents should be employed in cases in which surgical treatment is not indicated or operation is contra-indicated by some complication such as cardiac, pulmonary renal, or hepatic lesions. The various methods of treatment with physical agents are discussed.

Ducuing's conclusions are summarized as follows: Not all fibromata must be treated actively. Only "pathological" fibromata should be treated surgically or by roentgen or radium irradiation.

In cases in which the diagnosis is not certain, surgical treatment is indicated. This applies to all cases of fibroma with complications except those of the fibroma is large, Wertheim's method must be used, and if the fibroma is small it cannot be diagnosed without operation. In the absence of special indications, subtotal hysterectomy is preferable to total hysterectomy. When possible the ovaries should be preserved completely or in part.

3. There are numerous indications for the treatment of uterine fibroma by physical agents. Such treatment is probably indicated more frequently

than is generally assumed. In the majority of cases X-ray irradiation is preferable to radium irradiation. Fractional doses give the best results.

4. It appears that about 60 per cent of fibromata should be treated surgically and about 40 per cent by physical agents. AARON & SCHWARTZMAN, M. D.

## ADNEAL AND PERIUTERINE CONDITIONS

Aschheim, S.: The Action of Gonadotropic Substances on the Ovary (Ueber die Wirkung gonadotroper Stoffe auf den Eierstock). *Arch. f. Gynak.* 1914, 55, 44.

With a series of urines or urine extracts Aschheim was able to obtain only follicle maturation in ovaries. If he did not obtain rupture of the follicles or corpus luteum formation. He calls the factor producing the observed effect Factor A.

With amniotical extracts of the anterior lobe of the hypophysis it was possible to obtain in the ovaries of infantile animals only the formation of small atretic corpora lutea and to obtain them with danger. Occasionally there appeared only slight clearing of the follicular cells. Large doses caused maturation of corpora lutea already present without producing evidences of estrus in the vaginal smears and without causing enlargement of the uterus. From these facts the author concludes that the gonadotropic substances of the anterior lobe of the hypophysis and those excreted in the urine are different substances with a similar biological action. In contrast to Factor A there is Factor B which controls the development of the corpora lutea and vascularization.

Aschheim conducted experiments also to determine whether rupture of the follicles is caused by hormones. By injecting Factor A he succeeded in causing the formation of large follicles in the ovaries of infantile mice. As soon as vaginal smears showed the evidences of estrus he injected Factor B. The injection of Factor B was followed by the rupture of numerous follicles, the formation of corpora lutea, and the appearance of ova in the tubes.

In the physiological interaction of these two factors, the follicle-maturing Factor A and the follicle luteinizing Factor B, Factor A brings the follicles to maturation and then Factor B favors their rupture with extrusion of the ova, causes the granulosa cells to change into lutein cells, and, by the budding of new vessels from the theca cells, brings about vascularization of the corpus luteum. Therefore rupture of the follicles is not a mechanical process resulting from increased internal pressure but a process due to hormones in which Factor B acts upon the follicular cells in a manner as yet not understood. Factor A prepares the granulosa cells—sensitizes

them—for the action of Factor B, its effect being analogous to the sensitization of the uterine mucosa by the follicular hormone for the corpus luteum hormone  
HANS OTTO NEUMANN (G)

Montgomery, J. B., and Farrell, J. T., Jr. The Value of Postoperative Roentgen Irradiation in Carcinoma of the Ovary. *Am J Obst & Gynec*, 1934, 28 365

The authors outline a method for the clinical classification of ovarian carcinoma and report an analysis of twenty two cases with regard to type, grade of malignancy, operability, and response to post-operative roentgen irradiation. Of eleven patients treated more than five years ago, five (45 per cent) are alive. Of fourteen with a papillary cystadenocarcinoma, seven are still living and of three with a papillary adenocarcinoma, one is still living. Of four patients with an adenocarcinoma, all are dead. The one patient with a granulosa celled carcinoma is still alive.

The granulosa celled carcinoma is the least malignant, the papillary cystadenocarcinoma is more malignant, the papillary adenocarcinoma is more malignant than the papillary cystadenocarcinoma, and the adenocarcinoma the most malignant.

The histological grading of malignancy is important in the prognosis of ovarian carcinoma. Only one of the authors' patients who had a tumor of a high grade of malignancy survived more than five years. All of the patients with a tumor of an intermediate or high grade of malignancy are dead. Those with tumors of an intermediate grade of malignancy lived longer than those with tumors of a high grade of malignancy. The more completely operable the tumor the greater the life expectancy.

Postoperative irradiation is often of value in relieving the pain and ascites, reducing the size of the tumor, and prolonging life. In nearly all cases of ovarian carcinoma, regardless of the hopelessness of the prognosis, postoperative irradiation should be given if the patient's general condition permits.

In the discussion of this report, KEENE said that it is impossible to foretell the response to irradiation in a given case. He regards the histological type as of little or no value in the prognosis and X ray irradiation as of little value as a palliative measure. Of twenty six patients he treated two or more years ago, ten are still alive.  
EDWARD L. CORNELL, M.D.

#### MISCELLANEOUS

Klaften, E. Cystodilaphanoscopy. A New and Simple Method of Examination. *J Obst & Gynec Brit Emp*, 1934, 41 739

When cystoscopy in the dark chamber more than twelve years ago, Klaften was struck by the clear flashlight of the bladder. On the basis of this observation he conceived the idea of utilizing the bladder light, which had thus manifested itself as a luminous source, for visualizing the contents of transparent ovarian cysts and accumulations of fluid in the ab-

dominal cavity. He calls this procedure "diaphanoscopy." At first his efforts met with failure, but this was found to be due to the fact that the tumors he was viewing were either hemorrhagic with dark contents or composed of solid tissue. To date, he has made 730 diaphanoscopic examinations. By this means he has been able to distinguish between cysts and free fluid in the abdominal cavity. He has examined also cysts in the midline where it is otherwise difficult to differentiate between cysts and myoma of the uterus.

Translucent ovarian and parovarian cysts flash up like Chinese lanterns when they are lit. In cases of opaque cystomata with light absorbing contents and cases of solid ovarian tumors these lighting phenomena are missed. Cases of ascites, such for example, as those due to tuberculosis of the peritoneum, carcinoma of the peritoneum, congestive cardiac conditions, fibroma of the ovary, and granulosa-cell tumors, show the characteristic differences of a lighted-up lateral abdominal wall and an absolutely dark medial portion of the abdomen. When a fibroid and an ovarian cyst are present, the latter, if translucent, appears lighted up while the fibroid remains dark.

The technique is similar to that used in cystoscopy. By turning the light, a cystocele can often be seen through the vaginal wall, and by introducing the light into the rectum a rectocele can be demonstrated. The author hopes to enlarge the field of usefulness of this method of diagnosis to include pathological conditions in the upper abdomen such as pancreatic cysts and enlargements of the gall bladder.

HARRY W. FINE, M.D.

Caldwell, W. E., Moloy, H. C., and D'Esopo, D. A. Further Studies on the Pelvic Architecture. *Am J Obst & Gynec*, 1934, 28 482

The authors report a study of the shape of the pelvis of 215 primigravidae. They considered it advisable to modify their original classification of pelvises to include the mixed types in their proper position with respect to the 4 large or parent forms. They now classify pelvises as follows: (1) the true anthropoid type, (2) the anthropoid type with a gynecoid tendency, (3) the gynecoid type with an anthropoid tendency, (4) the gynecoid type with a narrow fore pelvis, (5) the true gynecoid type, (6) the gynecoid type with a tendency toward flatness, (7) the true flat (platypelloid) type, (8) the android type with an anthropoid tendency, (9) the android type with a gynecoid tendency, (10) the true android type, (11) the android type with a tendency toward flatness, and (12) asymmetrical forms.

An intermingling of types occurs when a posterior segment of one of the 4 parent groups is associated with the fore pelvis of another. This intermingling of posterior and anterior segments of the primary groups is due to the fact that the pelvic girdle develops from 7 distinct bone elements and any one element may display a radical departure in shape from the amplexness characteristic of the typical female form.

The authors advance the theory that a great influence may be at work, one, an arrest in evolution from the pre or true anthropoid form to the perfect human form which is characteristically flat, and, the other a sexual or hormonal factor which may determine certain masculine characters in the female form.

Of the pelvis studied, the inlet as large in 25 per cent, of average size in 50 per cent, and less than average size in 25 per cent. Of the pelvis of the gynecoid type, slightly fewer were small and slightly more were large. Of the android group, 44 per cent were small, whereas of the anthropoid group considerable number were large.

Many of the pelvis of the gynecoid group showed average or wide subpubic angles with corresponding decrease in narrow angles as compared with the series as a whole. In the android group there was a very definite tendency toward the narrow forms, the incidence of the latter being 4 per cent as compared with an incidence of 6 per cent in the series as a whole. The anthropoid pelvis showed a higher incidence of wide angles, the narrow variety occurring in only 35 per cent. This was an unexpected finding.

Heavy bones were found in 54 per cent of the android pelvis as compared with 19 per cent of the total number of pelvis. The width of the pubic arch gives no clue to the size of the fore pelvis. There is a marked relationship between the width of the arch and the spray of the side walls of the pelvis, narrow arches being associated with converging walls in 100 per cent of the pelvis studied. A significant correlation was found between the width of the subpubic angle and the sacrum.

Anisulination was noted in 1 per cent of the entire series of pelvis. Of the gynecoid group, 1 occurred in 6 per cent of the android group, in 7 per cent and of the anthropoid group in 23 per cent. Six sacral segments were found associated with narrow subpubic angles twice as frequently as with wide angles. In spite of this, anisulination was noted in 16 per cent of the pelvis with wide angles. Anisulination plays very minor rôle, if any at all, in the formation of narrow subpubic angle.

EDWARD L. CORNELL, M.D.

Gliardino, E. Researches and Considerations on Hypophyseal and Ovarian Hormones in the Menstrual Blood (Ricerche considerazioni sugli ormoni ovario-ipofisari nel sangue mestruale. *Rivista di ginecologia* 1934, 9, 26)

Gliardino reports series of experiments in which he determined the hormone content of menstrual blood. The menstrual blood was collected by means of metal uterine catheter to prevent contamination from the vaginal secretions as much as possible. The serum of the menstrual blood as injected into mice is repeated small doses until total of 0.3 c.c.m. had been injected. In control series similar amounts of serum of the circulating blood were injected.

Whereas death rarely followed the injection of 3 c.c.m. of serum of the circulating blood, 20 per cent of the animals died following the injection of similar amount of serum from menstrual blood. While the fatal effect of the serum of menstrual blood may have been due to contamination by cellular debris and mucus, which were difficult to remove, the author believes that some other toxic factor may have been responsible.

Following the injection of 3 c.c.m. of menstrual blood into prepubescent mice the ovaries were larger than normal and hyperemic, and contained numerous follicles. Histological examination disclosed almost complete absence of young follicles, but showed medium sized and mature follicles and others that had undergone atresia. Some of the cells of the granulosa had increased in size and others had undergone luteal transformation. Numerous corpora lutea were present.

The injection of 0 or 3 c.c.m. of serum of circulating blood into prepubescent mice produced few changes in the ovaries. Toward the periphery of the ovary there were few primordial follicles, and toward the center there was evidence of the formation of follicular cavities and of maturation, especially in the animals treated with 3 c.c.m.

After the injection of 3 c.c.m. of menstrual blood into castrated mice the entire uterus showed hypertrophy and hyperemia. The uterine mucosa was as deep and the epithelium was in the process of proliferation, showing many mitotic cellular divisions. In the base of the glands there was evidence of secretion.

Following the injection of 0 or 3 c.c.m. of serum of the circulating blood into castrated mice, the uterus showed mild congestion, the endometrium was moderately infiltrated, and the glands were in a state of rest.

From these experiments the author concludes that the menstrual blood contains four hormones in different concentrations. Prolan A and folliculin are present in greater amounts than Prolan B and lutein. There is a definite parallelism between the concentration of Prolan A and folliculin. A parallelism between Prolan B and lutein is less evident.

PETER A. ROSE, M.D.

Ansper, R. M. and Hoffman, J.: Endometrial Findings in Functional Menstrual Disorders. *Am. J. Obst. & Gynec.* 1934, 3, 473.

In study of ninety-six cases of amenorrhea, ninety-seven cases of uterine bleeding, and forty-two cases of apparently normal menstruation in which treatment as given for dysmenorrhea, sterility and obesity the authors found no constant relationship between the clinical symptoms and the development of premenstrual endometrium. They state that while the development of premenstrual endometrium invariably coincides with ovulation and the development of a corpus luteum and our understanding of the anabolic cycle is complete amenorrhea, uterine bleeding, and what appears to be normal

menstruation are associated with so many different states of the ovary that they are unable to explain the catabolic cycle

The clinical and laboratory findings seem to favor the recent tendency in the literature to question

1 The constancy of the relationship between the state of ovarian function and the periodicity of the flow

2 The truth of the idea that most healthy women menstruate regularly and at twenty eight day intervals

3 The validity of the view that menstrual bleeding depends upon regression of the corpus luteum (negative phenomenon)

The authors believe that bleeding may be due to a positive mechanism thus far unexplained

As amenorrhœa, oligomenorrhœa, and functional uterine bleeding of any sort are unreliable as positive indices of ovarian function, a test curettage is important in the diagnosis and treatment of functional gynecological disorders. Correct evaluation of the uterine mucosa depends upon the recovery of mucosa from all parts of the uterine cavity. The use of a pipette curette is inadequate for this purpose.

In the discussion of this report PAYNE stated that under normal conditions the endometrium is constantly changing. In regularly menstruating women a characteristic picture is seen for each period of the menstrual cycle. Examination of a single specimen of endometrium taken at a given time during that cycle is sufficient. However, in the event of amenorrhœa or menstrual irregularity, a single curettage is of little value in determining the endometrial changes. Hyperplasia is a coincidental condition and not the causative factor of functional uterine hemorrhage.

EDWARD L. CORNELL, M.D.

Kurzrok, R., Kirkman, I. J., and Creelman, M. Studies Relating to the Time of Human Ovulation. *Am J Obst & Gynec*, 1934, 28 319.

The daily excretion of Prolan A (follicle stimulating hormone) of ten young women was studied over extended periods of time. Sudden excretion of this hormone occurred at about the middle of the menstrual cycle and had a definite tendency to recur at about the same time in the following cycle. This sudden secretion of Prolan A from the anterior lobe of the pituitary gland is considered to be the stimulus to the ovaries to induce ovulation. Evidence is cited in support of the view that ovulation follows the Prolan A excretion within about twenty-four hours. It is believed that ovulation cannot occur without the stimulus of Prolan A. However, the presence of this substance is not prima facie evidence of the occurrence of ovulation.

The time of ovulation as suggested by this method is in complete agreement with the results of all other methods used in the study of the problem. The greatest incidence of Prolan A excretion was between the tenth and the thirteenth days, hence the greatest incidence of ovulation was between the eleventh and fourteenth days.

One of the cases suggested the possibility of menstruation without ovulation, and another, of ovulation without previous menstruation. Two of the patients studied became pregnant while under observation. In both, the course of events was noted from menstruation through the termination of pregnancy.

Suggestive time relationships between menstruation, ovulation, fertilization, migration of the fertilized ovum, and nidation are considered. In two cases a positive Aschheim Zondek test was obtained very early, namely, on the twenty-fifth and twenty-seventh days after the onset of the last menstrual period or two days before and one day after the expected onset of the skipped period.

The sudden change from a positive Aschheim-Zondek test to a positive Prolan A reaction at the end of pregnancy is suggestive of multiplicity of the gonadotropic hormones from the anterior lobe of the pituitary gland.

In the discussion of this report FRANK said that the only deduction he was willing to draw from his studies of blood and Kurzrok's studies of urine is that when this kind of hormone is found in the blood or urine or both on the ninth and eleventh days, the prepituitary, adeno-hypophysis, is acting cyclically. As ovulation depends on so many extraneous factors, Frank does not believe its occurrence can be considered proved by these tests.

EDWARD L. CORNELL, M.D.

Paroli, G. The Problem of the Sensibility of the Female Internal Genital Organs and the Question of Pain in Gynecological Diseases and Labor (Il problema della sensibilità degli organi genitali interni femminili e la questione del dolore nelle affezioni ginecologiche e nel travaglio di parto). *Riv ital di ginec*, 1934, 16 113.

Paroli reviews the anatomy of the female internal genital organs with special reference to the sympathetics, the somatome associations, and the factors which influence pain and the interpretation of pain. He discusses particularly referred pain and the results of peripheral treatment by novocainization of the area to which the pain is referred. In many of his cases this treatment was moderately successful.

He states that the pain associated with the female internal genitalia behaves like visceral pain in general, having specific peripheral zones of reference. This phenomenon of peripheral reference is explained best by transmission of the pain through the parietal pathways which correspond to the same sections of the spinal cord as the visceral sympathetic pathways. Referred pain is of importance as a warning sign of an internal disturbance.

The zones of peripheral referred pain from the genitalia are different for the adnexa and the uterine corpus and cervix. Adnexal pain is referred to two bilaterally symmetrical zones which correspond more or less to the zone of the middle third of the inguinal ligament and to secondary zones in the lumbar region and the anterolateral aspect of the thigh correspond-



ing to the first, second, and third lumbar segments. Peripheral anesthetization in the region of the first lumbar segment results in marked relief.

Pain in the body of the uterus is referred to two symmetrical paramedial suprapubic zones which represent part of the first lumbar neuromere. Pain in the cervix of the uterus is referred principally to the lumboaxillary region. Peripheral anesthesia gives fairly good results in the corpus alone, but only mediocre results in the cervical zone. The angular portions of the uterus have an innervation like that of the adnexa.

The pains of labor are referred to the zones described for the various parts of the genitalia. In cases of dystocia due to cervical spasm, the lumboaxillary pain is particularly severe. In such cases the general antispasmodics are of value, but belladonna is best as the nerves responsible are predominantly parasympathetic. Local anesthetization has not proved of much aid in labor.

In cases of pain due to acute and chronic adnexal inflammations, tumor torsions, and genital carcinomas, peripheral novocainization often results in prolonged, and sometimes permanent relief.

A. LOOS RÖW, M.D.

Sturte, L.: The Endothelial Sign in Obstetrics and Gynecology (Il segno endotheliale nel campo ostetrico-ginecologico). *Riv endo di ginec.* 1934, 6: 303.

The demonstration of the endothelial sign depends upon increased endothelial permeability and consists essentially of a more or less accurate count of the petechial hemorrhages occurring in the cubital fossa following constriction of the circulation at certain specified pressure and for a definite length of time.

When the number of petechial hemorrhages does not exceed 5, the test is regarded as negative. When from 6 to 30 hemorrhages occur it is considered positive, when from 30 to 100 hemorrhages result, it is considered definitely positive and when the number of hemorrhages exceeds 100, it is considered in tenacity positive.

Sturte studied the endothelial sign in 30 cases of normal pregnancy, 8 cases of pregnancy complicated by toxemia, 30 cases of adnexal disease, and cases of fibroids.

Of the cases of normal pregnancy, positive endothelial sign was noted in 1 (3 per cent) and of the cases of pregnancy complicated by toxemia, it was found in 8 (44 per cent). In the cases of toxemia the frequency of the positive sign seemed to increase with the blood pressure. Of the 30 cases of adnexal disease, the sign was positive in 7 (23 per cent). Of 3 cases of ovarian cysts, the sign was positive before operation in 3 (4 per cent). No increase in the frequency of positive sign was found after partial or complete abolition of ovarian function in such cases. In the cases of fibroids, a positive endothelial sign was extremely rare before operation and remained so after hysterectomy with or without unilateral oophorectomy but of 6 cases in which hysterectomy

was done with bilateral oophorectomy it became positive in all.

Other investigators have reported an increase in the frequency of positive endothelial sign during menstruation and the climacterium and have suggested that the mechanism is a disturbance of ovarian function.

The author is of the opinion that endocrine activity is not the only factor involved.

Gaston C. Finck, M.D.

Williams, W. R.: Heterotopic Teeth and Their Significance, with Special Reference to the Intra-Abdominal Group. *J. Obst. & Gynec. Brit Emp.* 1934, 41: 72.

Teeth being highly specialized and complex dermal appendages which, in man, occur normally only in the dental arches of the oral region or as local anomalies in the immediate vicinity of these arches, their occurrence in other parts of the body challenges attention. It proves the persistence of diplo-genetic residues of fetal structures parasitic in the body of the host and demonstrates their capacity for subsequent growth and development along normal, abnormal, and neoplastic lines. They do not occur just anywhere but only in regions where tentoid and dermoid formations are found, notably in the intra-abdominal cavity.

Heterotopic teeth are the most significant constituents of teratomata. The author has traced the origin of these growths to asymmetrical displacements of one or the other of the extremities of the nascent cephalic axis. Most teratomata occur in the abdomino-pelvic regions, and it is there also that most heterotopic teeth are found. These teratomata form a chain extending from the root of the primitive mesentery by way of the dorsal part of the pelvis and in front of the sacrum and coccyx to the sacrococcygeal vicinity. Along this entire route heterotopic teeth are relatively common. They all arise in the extra-peritoneal tissue of the primitive mesentery. Their genetic affinities are therefore abdominal. The tentoid germ arises before the peritoneum is evolved. As the evolving axis elongates in the course of growth, some of these primitive tentoid germs are carried into the dorsal part of the pelvis and others into the sacrococcygeal region. The author has collected and studied a large number of these tumors from various regions and has followed their development in detail.

HARRY W. FINE, M.D.

Gillerson, A. and Fainstein, S.: The Temperature and Vascular Reaction in the Treatment of Inflammatory Diseases of the Female Genitalia by Heat Procedures (Die Temperatur- und Gefässreaktion bei der Behandlung entzündlicher Erkrankungen der weiblichen Genitalia mit Wärme-prozeduren). *Ginec.* 1934, 6.

The authors have made detailed and interesting investigations regarding the reaction of the vessels and the temperature in the treatment of inflammatory diseases of the female genitalia with heat pro-

cedures Fifty-five women were subjected to 186 individual examinations The examinations consisted of determinations of the temperature in the vagina and the axilla, the weight, the blood pressure, and other determinations before, during, and after the local application of heat

The temperature in the axilla and vagina rose according to the kind of heat induction The strongest reaction was observed after the application of a steam douche, and the next strongest, after hot sitz-baths and electrical hot air treatment The difference between the temperature of the axilla and the temperature of the vagina, which as a rule is 0.6 degree, increased to 1.2 degrees, indicating apparently that damp heat can be introduced more successfully into the deeper regions than dry heat.

In a detailed investigation of the effect of the local application of heat on the vascular system and heart the authors found that the systolic and diastolic blood-pressure decreased on the application of damp heat, but rose when heat was applied with the electric arc light. They report good therapeutic results from the various heating procedures

(VON GLASEN APP) CLARENCE C REED, M D

Walther, O Lymphosarcomatosis of the Female Genital Organs (Ueber die Lymphosarkomatose der weiblichen Genitalorgane) *Arch f Gynaek*, 1934, 157 44

The author discusses six cases of lymphosarcoma of the female genital organs, two of which were his own The latter are reported in more detail than the others In five of the six cases the tumor began in the uterus and in one case apparently in the ovaries

Histologically, five of the tumors showed medium tissue maturity (according to Ghon and Roman),

that is, the tumor cells resembled lymphoblasts and lymphocytes In one case, because of the marked cell polymorphism, the histological structure of the tumor tissue, resembled that of a "retiothel sarcoma" (Roulet) The lymphatic tissue of the tumors was very immature

The growth of the tumor tissue from the uterus and ovaries progresses first by infiltration to the neighboring genital organs As a result, lymphogenous metastases often arise in the retroperitoneal lymphatic glands and also in groups of lymphatic glands further removed, and here and there hæmatogenous and implantation metastases appear

In none of the six cases reviewed did the spleen, liver, or bone marrow show leukæmic changes Neither were such changes found in the blood in the one case in which a blood examination was made Therefore a systemic leukæmic disease was ruled out

The site of origin of a lymphosarcoma is pre-existing lymphatic tissue In the first five of the cases reviewed it was the lymphatic tissue of the uterine mucosa, in which lymph follicles are frequently present When the site of origin of the tumor formation is in the ovaries, it must be assumed that a lymph follicle formation with an inflammatory basis is the matrix of the tumor tissue

The clinical picture of lymphosarcoma of the female genital organs greatly resembles that of carcinoma of the uterus, except that the tumor is much more malignant, grows faster into the surrounding parts, develops metastases much earlier, and leads to death much sooner than carcinoma of the uterus

According to the reports to date lymphosarcoma of the female genital organs occurs between the ages of forty-five and sixty-five years

(HANS O NEUMANN) CLARENCE C REED, M D

# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

Neuweller W: The Content of Thyroid-Gland Hormone in the Blood During Pregnancy (Ueber den Schilddrüsenhormongehalt des Blutes in der Schwangerschaft) *Arch f Gynak* 1922, 34 395.

The author undertook to determine whether there is an increase in active thyroid gland secretion in the blood during pregnancy. To determine the functional condition of the thyroid during pregnancy various tests for demonstrating the thyroid hormone were used. Unfortunately none of these tests, when positive, is alone sufficient for positive identification of a questionable substance as the thyroid hormone. Therefore, to identify a substance as thyroid hormone with any degree of certainty it is necessary to obtain a definitely positive result with several tests. For his investigations the author used the following procedures: (1) determination of the basal metabolism; (2) determination of the effect of the serum of the pregnant woman on the glycogen content of the liver of the rat; (3) determination of the effect of the serum of the pregnant woman on the content of acetone bodies in the blood of the rat; (4) determination of the variations in lactic acid content of the blood of the pregnant woman during rest and during measured exercise; (5) determination of the Reid-Haast reaction; and (6) the Gordenat experiment.

The tests were made either on pregnant women or with the blood of pregnant women. Most of the subjects were women with goiter who showed no definite signs of hyperthyroidism or hypothyroidism.

The findings of numerous investigators and notably those of Hoffmann and Anselmino were not confirmed. The basal metabolism of the pregnant women was about normal. While increases were demonstrated, they were not the rule. No relationship was found between the goiter and the basal metabolism of pregnant women. The blood of pregnant and non-pregnant rats fed on a diet rich in carbohydrates led to similar decrease in the glycogen content of the liver. Therefore, no difference was apparent between the two types of serum. The serum of cretine showed decidedly less marked effect on the liver glycogen. When rats fed a diet rich in carbohydrates were injected with the serum of pregnant women the serum had no effect upon the content of acetone bodies in the blood of the animals. The author describes a new photometric method of determining the content of acetone bodies in the blood.

The lactic acid content of the blood of normal pregnant women showed no increase over that of the blood of non-pregnant women. Neither did it

show any noteworthy increase after measured exercise as compared with that of non-pregnant women. No relationship was apparent between the goiter of pregnant women and the effect of the blood of such women on the liver glycogen or the content of acetone bodies in the blood of rats. No relationship between the goiter and the lactic acid content of the blood of the pregnant women could be determined. When mice were injected with the blood of pregnant women they were not protected against poisoning by acetone. In the Gordenat experiment the blood of the pregnant women caused no change in the metamorphosis of the tadpoles, but in the active stages there was slight increase in resistance as compared with the effect of the blood of non-pregnant women. In the inactive state no difference in the effects of the two types of blood was demonstrable. Feeding with tissue from the anterior lobe of the pituitary gland or with prolactin had no influence on the growth or metamorphosis of the tadpoles.

On the basis of his findings the author rejects the theory of demonstrable physiological hyperthyroidism during pregnancy. However he believes that, in spite of his findings, there is, as anatomical investigations suggest, a non-demonstrable hyperfunction of the thyroid. Without doubt, the thyroid gland is subjected to increased demands during pregnancy. In this fact the author sees no refutation of his findings since in his investigations he attempted to determine only whether the content of thyroid hormone in the blood is increased during pregnancy. It is to be assumed that, as the result of the increased demand, the need for the hormone is increased and is met by thyroid hyperfunction. According to this theory there may well be a hyperfunction of the thyroid during pregnancy but, because of the greater stimulation of the thyroid secretion, the hyperthyroidism is not manifested clinically by an increase in the content of thyroid hormone in the blood. H. SIMONSON (C)

Madruzzu, G. The Work of the Urinary Bladder in Pregnancy (Il lavoro della vescica in gravidanza) *Riv Biol* 23 June 1924, 5 253

To determine the work of the urinary bladder Madruzzu uses an apparatus he devised which consists essentially of a mercury manometer and a kymograph attached to an ordinary cystoscope. By means of this apparatus it is possible to record the bladder distention necessary to stimulate the desire to void and the capacity of the bladder. From the readings Madruzzu calculates the motor activity of the bladder in gram centimeters of work.

The studies reported in this article were made on nine non-pregnant women, twenty-five women at

## OBSTETRICS

various stages of pregnancy, and ten women in the puerperium

It was found that the amount of solution necessary to provoke a desire to void ranged from 250 to 400 c.cm in the cases of the non pregnant women, from 450 to 700 c.cm in the cases of the pregnant women, and from 600 to 800 c.cm in the cases of the women in the puerperium. The motor activity of the bladder expressed in gram centimeters for the three groups was, respectively, 16,000, 25,000, and 65,400 gm cm.

These figures reveal a definite modification of bladder function incident to pregnancy. While the causes of the influence of pregnancy on bladder function are obscure, the author believes that they include the anatomical changes in size and shape occurring in pregnancy and pathological changes resulting from compression during labor.

GEORGE C. FINOLA, M.D.

Traina Rao, G. Abnormal Conditions of Pregnancy and the Sugar Content of the Blood of the Mother and Child (*Stati morbose gravidica e tasso glucemico materno e fetale*). *Riv. ital. di ginec.*, 1934, 16, 1.

The author found that in cases of normal pregnancy the sugar content of the blood of the mother during labor was slightly increased. The sugar content of the blood of the umbilical cord was always lower than that of the blood of the mother. During the first twenty-four hours of life the sugar content of the blood of the child was about the same as that of the blood of the mother. In the first ten days of life it showed first a tendency to decrease and then a tendency to rise.

In nephroses of pregnancy the sugar content of the blood of the mother was about normal, whereas in eclampsia it showed a decrease. The difference between the sugar content of the blood of the umbilical cord and that of the mother was more marked than in the cases of normal pregnancy.

In cases of acute infection with hyperthermia in the mother the sugar content of the blood of the mother tended to increase and the sugar content of the blood of the newborn child showed a marked increase which was maintained during the first ten days of life. On the other hand, in cases of chronic infection in the mother, the sugar content of the blood of the mother was not greatly changed and the sugar content of the blood of the child usually showed a decrease.

The sugar content of the blood of premature infants was low, but increased as the child developed.

A. LOUIS ROST, M.D.

Garrasi, G. Myelogenous and Lymphatic Leukæmias and Aleukæmias Associated with Pregnancy (*Le mielosi e le linfo adenosi leucemiche ed aleucemiche associate alle gravidanza*). *Riv. ital. di ginec.*, 1934, 16, 295.

The infrequency of leukæmias and aleukæmias associated with pregnancy is evident from the fact

that the author was able to collect only fifty-eight cases from the literature. To these he adds a case which came under his observation at the Gynecological Institute of the Modena University.

These diseases occur practically always in multiparae and between the ages of fifteen and forty years. They are divided into acute and chronic forms. Of the fifty-nine patients whose cases are reviewed, thirty had chronic myelogenous leukæmia, seven, acute myelogenous leukæmia, two, acute myelogenous aleukæmia, six, acute lymphatic leukæmia, two, chronic lymphatic aleukæmia, and two, pernicious anemia. In the cases of ten, the condition was not definitely classified.

Pregnancy does not predispose to these diseases. In twenty of the thirty chronic cases reviewed, the condition could be definitely traced to a period preceding the pregnancy by several months. However, of the sixteen acute cases, it began during pregnancy in thirteen, during labor in one, and before pregnancy in two.

The prospects for continuance of the pregnancy to term is unfavorable in all forms. Of the acute cases reviewed, pregnancy went to term in only 37 per cent, and of the chronic cases, it went to term in only 47 per cent. The incidence of abortion and premature labor was high, but the author attributes it to mechanical factors such as dyspnea and limitation of space by the enlarged spleen. In both twenty-four chronic cases and ten acute cases in which the pregnancy went to term there were two stillbirths.

Of the women with a chronic condition, sixteen survived, of which two became pregnant again, and five died during pregnancy, labor, or puerperium. Of the women with an acute condition, seven died in the puerperium and one left the Institute in poor general condition.

Grave hemorrhages occurred in the third stage in practically all of the acute cases, whereas in the chronic cases the loss of blood in the third stage was less than that in the cases of normal women.

The treatment included splenectomy, blood transfusion, and interruption of the pregnancy, but the best results were obtained from the administration of arsenicals by mouth and X-ray irradiation over the spleen.

The author's conclusions are summarized as follows:

1. Pregnancy does not predispose to these diseases.
2. Pregnancy aggravates both the acute and the chronic types of leukæmias and aleukæmias.
3. A child born of a mother with leukæmia or aleukæmia is normal.
4. In the chronic forms, the mother tolerates parturition and the puerperium quite well, while in the acute forms death is almost certain.
5. It is best to allow the pregnancy to continue in the hope of obtaining a living baby.
6. The most satisfactory treatment seems to be the administration of arsenicals and irradiation.

GEORGE C. FINOLA, M.D.

## INTERNATIONAL ABSTRACT OF SURGERY

Aslra, H. B. Pernicious Vomiting of Pregnancy  
*J. Obst. & Gynec. Brit. Emp.* 1934, 4, 730.

Aslra claims that pernicious vomiting of pregnancy is always a neurotic manifestation, and that the changes found in the liver after death in cases of such vomiting are due to starvation and loss of gastric juice.

He attributes the vomiting to distorted subconscious attempt on the part of the patient to rid herself of the fetus. In the majority of thirty reported cases evidence of a "psychological conflict" is present in the majority and uniform success attended treatment by suggestion.

ABRAHAM A. BRADLEY, M.D.

Coffey, P. Death from Eclampsia (Ueber den Eklampsiedtod). *Zentralbl. f. Gynak.* 1934, p. 903.

It is noteworthy that up to the present time little that is exact has been known concerning death from eclampsia. The author therefore made a careful study of five fatal cases. Three of the women died during or shortly after an attack and (a) died with symptoms of pulmonary edema and renal failure. In the cases of the first group an attempt was made to clarify the mechanism of sudden death from eclampsia. One of the patients in this group died during an attack which occurred while she was being transported to the hospital. The two others succumbed shortly after an attack in which only the tonic phase had developed, but marked disturbances of the pulse were noted between the attack and the occurrence of death. While the first case autopsy performed immediately after death showed the heart to be firmly contracted (the other organs showed typical eclamptic changes) in both of the two other cases there were extensive hemorrhages in the conductive system which accounted for the irregularity of the pulse following the attack. Evidently the tonic phase of the attack is the most dangerous. Practical observations and theoretical considerations indicate that cardiac failure is more important cause of death during or after an attack of eclampsia than has been assumed heretofore. Theoretically sudden death in eclampsia may be one of the following types:

1. Death from asphyxia of central origin due to vascular spasms in the region of the respiratory center.

2. Death from participation of the heart in the tonic phase of the eclamptic attack.

3. Death from coronary spasm, similar to angina pectoris.

4. Death from shock due either to changes in the vagus center, vascular spasms in the medulla oblongata, or irritation of the pulmonary branches of the vagus in the tonic phase of the eclamptic attack. The author states that definite decision as to the factor or factors responsible for the fatal outcome will be rendered possible only by correlation of the clinical and autopsy findings in large series of cases in which autopsy is performed immediately after death.

In both of Coffey's cases of death following symptoms of renal failure there was a marked congenital hypoplasia of the left kidney and apparently only the right kidney was functioning. In one of them the left kidney was the size of a fetal kidney. These two cases were similar to the first case in Group I in which the right kidney showed advanced caseous and cystic glomerular tuberculous destruction of the renal parenchyma. From a practical point of view these three cases may be regarded as cases of solitary kidney. The reaction to eclampsia of women with only one kidney as shown in this series and in cases of unilateral nephrectomy reported in the literature does not differ from that of women with two kidneys. It is obviously not true that the tendency to develop eclampsia depends upon the amount of renal parenchyma present. However, in cases of renal parenchyma present, destruction of the parenchyma, present comes so advanced that cataleptic results, and in the most severe and rapidly fatal cases seen in the Koenigsberg Clinic in the period of a year marked reduction in the amount of renal parenchyma was found.

In conclusion the author says that determination of the relationship between eclampsia and renal function will require close cooperation between clinicians and pathologists.

(P. CURTIS) HAROLD C. MARK, M.D.

Trains, R. G. The Neurovegetative Basis in Pyloric of Pregnancy (Le stato neurovegetativo nella pylorica gravidica). *Riv. Ital. Ginec.* 1934, 15, 357.

The pyloric of pregnancy has been attributed to a factor responsible for the stasis in compression of the ureter by the gravid uterus. In addition to this mechanical process, a number of investigators have demonstrated that there is also an associated toxic of the ureter.

Klein, Kehler and others attribute the ureteral stasis to a disturbance of the neurovegetative balance.

The author calls attention to the fact that the urinary excretory apparatus is innervated by a rich network of nerve ganglia (Hirzschel, Hoffbauer) and is therefore evident that the sympathetic and parasympathetic have direct influence on ureteral function. Since the function of any organ is dependent upon its tone and excitability, any factor acting directly or indirectly on this nervous system, such as drugs (adrenalin) or the calcium-potassium balance also influences the activity of the ureter.

The author lists all body functions which illustrate tone and all illustrating excitability which determinations of tone and excitability of adrenalin response, and the calcium potassium balance are made. The results showed that the majority of women affected with pyloric of pregnancy have hypertonia of the parasympathetics. With-

er the predominance of the parasympathetic influence or a deficiency of the sympathetics is responsible for the diminution of tone is uncertain

GEORGE C FINOLA, M D

### LABOR AND ITS COMPLICATIONS

Voron, J, and Pigeaud, H. *Managed Labor The Efficacy and Innocuity of Certain Procedures Intended to Direct the Course of Labor* (L'accouchement dirigé Efficacité et innocuité de certains procédés destinés à diriger la marche du travail) *Gynec et obst*, 1934, 30 113

By the term "managed labor" the authors mean labor influenced by the application of a series of procedures, some purely obstetrical, such as artificial rupture of the membranes, and others purely medical, such as the subcutaneous injection of spasalgine and extract of the posterior lobe of the pituitary gland or the administration of quinine or chloral hy mouth. These procedures are intended to accelerate the progress and diminish the pains of labor.

Artificial rupture of the membranes definitely accelerates the progress of labor in normal cases. The authors believe it should be done in every labor when the pelvic measurements and uterine contractions are normal, the fetus is of normal size, and the cervix is dilated between 4 and 6 cm.

The subcutaneous administration of spasalgine diminishes spasmodic contractions of Bandl's ring. When such spasms are recognized, it is possible to inject several ampoules of spasalgine at intervals of fifteen minutes without causing harm. In many cases in which spasms of the lower uterine segment could not be diagnosed definitely but the uterine contractions were so frequent as to be almost constant, a single injection of spasalgine has resulted in proper spacing of the contractions and suppression of the extremely annoying lumbar pains. The authors have given as many as five injections of spasalgine during labor without causing injury to the fetus. While spasalgine should not be administered routinely, it finds numerous indications during labor.

The subcutaneous injection of extract of the posterior lobe of the pituitary gland in doses of 2 international units is incapable of producing exaggerated uterine contractions or tetany, but in the great majority of cases is sufficient to overcome relative uterine inertia developing during labor, either before complete cervical dilatation or during the second stage.

The administration of quinine sulphate or syrup of chloral by mouth is an old practice which has been proved to be a valuable adjunct to obstetrical procedures.

These methods of directing labor were investigated by the authors by clinical and graphic methods. For study of the uterine contractions the hystero-graph of Fabre was used. The findings demonstrated that the procedures are efficient and innocuous.

HAROLD C MACK, M D

Gauss, F J. *The Conduct of Labor in Cases of Placenta Prævia, with Special Reference to the Scalp Forceps* (Die Geburtsleitung bei Placenta prævia unter besonderer Berücksichtigung der Kopfschwanzenge) *Fortschr d Therap*, 1934, 10 16

The author first compares the results of the management of cases of placenta prævia in the clinic at Wuerzburg during his directorate there with the statistics of Ammonn based on the world literature. This comparison shows that the results are most favorable for the mother in cases of spontaneous delivery. However, spontaneous delivery is possible relatively seldom. Cases of manual rupture of the sac may be reckoned with those of spontaneous delivery. Vaginal tamponade is to be rejected as particularly dangerous for the mother. The internal version of Braxton-Hicks is unfavorable for the mother and associated with an infant mortality of from 70 to 80 per cent. Similarly unfavorable is the pulling down of a foot in cases of primary pelvic presentation. Metreuryasis (extra-ovular and intra-ovular) may somewhat reduce the infant mortality, but does not reduce the maternal mortality. Particularly dangerous is immediate extraction after version. This is never done at the Wuerzburg clinic. According to the statistics based on the world literature it has a maternal mortality of 10 per cent and an infant mortality of 50 per cent. The results of abdominal cesarean section in the Wuerzburg clinic are poor, but this unfavorable impression may be due to the relatively small number of cases. The statistics based on the world literature indicate that results are good as far as the life of the child is concerned, but the maternal mortality is still 7.3 per cent.

Recognizing the fact that the results are best when delivery occurs spontaneously, the author worked out a special method which, even in the presence of total placenta prævia, permits a sort of spontaneous delivery. Following either rupture of the sac or perforation of the placenta, the infant's scalp is grasped with a specially constructed scalp forceps, a certain amount of continuous pull is applied to the forceps, and spontaneous delivery is then awaited. Hemostasis is obtained by the constant pull on the forceps. That the indications for this procedure may be widely placed is indicated by the author's statistics which show that since the introduction of the method "spontaneous delivery" has been rendered possible in three-fourths of all cases of placenta prævia, in the great majority of which the scalp forceps were applied. Of eighteen mothers, only one died and the latter was already infected at the time she entered the clinic. Of the infants—with the exception of those already dead when the forceps were applied and those in a few cases in which the forceps method was used when not indicated—75 per cent were saved. On the basis of his experience the author urges that his method be tested in large numbers of cases.

(VOY MIKULICZ RADECKI) JOHN W BRENNAN, M D

## PUERPERIUM AND ITS COMPLICATIONS

Michon, P. and Loryot, J.: Two Cases of Severe Puerperal Anemia (Deux cas d'anémie grave dans le post-partum) *Bull. Soc. d'obst. et de gynéc. de Par.* 1934, 24, 443

Two cases of severe puerperal anemia with nervous features in common are reported.

The first was that of a woman twenty-three years of age who came from a large family. Of her eight brothers and sisters, six were living and well and two died in infancy. At the age of fifteen the patient had erysipelas. She has been married for eighteen months. She was somewhat pale, but her general health was apparently good. She became pregnant at the end of the tenth month of marriage, and the course of her pregnancy was normal up to the sixth month. She then began to suffer from fatigue on the least exertion and developed edema of the lower extremities. She gained the impression that she was carrying twins. Examination at that time revealed albumin in the urine and blood pressure of 160/100. Under dietary treatment the albumin decreased somewhat. Slight vaginal and nasal hemorrhages appeared then without apparent cause.

Labor pains began at the end of the eighth month of pregnancy. When the patient was admitted to the obstetrical clinic on December 1, 1933, she was strikingly pale and presented traces of vaginal hemorrhage and a slight ecchymosis on the left thigh and in the gluteal region. The liver and spleen were normal. The pulse rate was 91 per minute, and there was a systolic murmur at the base of the heart. The urine showed traces of albumin. The blood pressure was 60/100.

The labor terminated in the delivery of two boys weighing 1,800 and 1,950 gm. Following delivery the pale skin became more pronounced. The first few days after labor the temperature was normal, but the patient was very weak and began to complain of a decrease of vision. Examination of the eye grounds revealed bilateral hemorrhagic retinitis with perimacular and peripapillary hemorrhagic plaques, edema, and exudate.

The findings of the blood cell count were: red cells, 1,440,000; white cells, 3,700; neutrophils, 83 per cent; eosinophiles, none; basophiles, none; lymphocytes, 31 per cent. There were no abnormal red cells. The bleeding time was ten min. The coagulation time and the fragility of the blood cells was normal.

The anemia became more severe in spite of treatment. On September 30 the red cell count was 900,000 and the white cell count 4,600. Under the influence of a few small transfusions the anemia decreased somewhat. The temperature varied daily from 37 to 39 degrees C. The patient complained of dyspnea and severe precordial pains. On January 3, transfusion of 60 ccm was poorly tolerated, but symptoms of shock did not develop. The condition became gradually worse. On January 8, the

temperature rose to 40.6 degrees C. and the patient became comatose. At this time a rough diastolic murmur was heard at the base of the heart. The blood pressure was 100/55. The liver was large and tender. A severe edema developed in the lumbar region and the abdomen became distended, but the abdominal walls remained soft.

A probable diagnosis of malignant endocarditis was made and digitalis therapy instituted.

On January 27 the temperature fell by crisis, the precordial pains ceased and the appetite began to improve. Thereafter recovery was rapid. The diastolic murmur disappeared and the patient became able to get up. While even then the red cell count was 678,000 and the white cell count 6,300, the general condition was so good that it was difficult to keep the patient in bed. On May 15 she still appeared somewhat pale, although the color of the mucosa was normal. The pulse rate at this time was 80 per minute and there was a slight systolic murmur at the base of the heart. However, there was no dyspnea and no anemia, and the liver and spleen were normal. The blood pressure was 100/55, vision was perfect, and the red cell count was 3,580,000.

The second case is also reported in detail. In summarizing their findings and conclusions the authors call attention to the fact that in both of these cases an anemic state was present before labor. In one of them ten months previously and in the other two years previously. The conditions which favored the development of the severe puerperal anemia were, in one case, a multiple pregnancy and in the other antithetic therapy. In addition to a considerable loss of blood during labor. In both cases the anemia was aggravated by massive destruction of red cells immediately following delivery.

The authors emphasize that it is necessary to differentiate between an anemia directly related and determined by pregnancy and a pre-existing anemia aggravated by the puerperium. In both of the cases reported the cardiac syndrome characterized by severe precordial pains, dyspnea, the absence of pulmonary signs, and a basal diastolic murmur led to an erroneous diagnosis of malignant endocarditis. Also in both cases transfusions were of doubtful value and liver extract and general tonics were more effective.

ALDO S. SCHWARTZMAN, M.D.

## MISCELLANEOUS

Sodano, A. The Reaction of the Blood to Gotta Diaphoretic in Obstetrics (La reazione del sangue al gottadiaphoretic nel campo ostetrico). *Arch. di obst. ginec.* 1934, 41, 483.

Sodano checked up the value of the gottadiaphoretic reaction as a means of diagnosing pregnancy as it has been claimed that this reaction is quite as dependable as the reaction of Aschheim and Zondek. He discusses the theory and technique of the test and summarizes his findings as follows:

## OBSTETRICS

1 In ten cases of advanced normal pregnancy the guttadiaphot reaction of Mayer, Bierast, and Schilling was always negative in the blood of the woman, and the blood of the umbilical cord after parturition.

2 The reaction was negative also in six cases of eclampsia, both in the blood of the woman and that of the umbilical cord.

3 Of six cases of pregnancy in tuberculous women, it was positive in the maternal and fetal blood in two. However, it was not very definite and was less marked in the fetal than in the maternal blood.

4 Of twenty cases of pregnancy in luetics, it was positive in the maternal in 75 per cent and in the fetal blood in 85 per cent.

The author concludes that even though the reaction does not always give positive diagnostic evidence because it is neither especially sensitive nor specific, it may prove of value when its technique is better developed, particularly for a quick diagnosis of syphilis.

EUGENE T. LEDDY, M.D.  
Schuman, W. A New Measurement (Clinical) for Estimating the Depth of the True Pelvis. *Am. J. Obst. & Gynec.*, 1934, 28: 497.

The purpose of this article is to call attention to the use of a new external measurement based on the

suggestions of Caldwell and Moloy and intended to estimate the depth of the true pelvis.

Since it is the anterior portion of the pelvis which presents the most frequent and distinctive characteristics of the male or android type of pelvis, it is quite logical to seek, in the fore pelvis, a measurement which will represent the most constant of the male characteristics, that is, increased depth. In measuring the perpendicular distance from the tuberosity of the ischium to the iliopectineal line in the pelvis of fifty-three white males and fifty white females Todd found that this distance averaged 101 mm in the male and 90 mm in the female.

The author takes this measurement after the ischial tuberosity diameter has been measured, and with one end of the pelvimeter still on the tuberosity, swings the other end around to a point on the upper border of the superior ramus of the pubis directly perpendicular to the tuberosity. This distance averages 11.5 cm. Allowance must be made for pubic and gluteal fat. In the cases of persons of normal build, 1 cm, and in the cases of obese persons, 2 cm, should be allowed for the soft parts. Schuman calls the measurement which is obtained in this manner the "pubotuberosity diameter."

EDWARD L. CORNELL, M.D.



# GENITO-URINARY SURGERY

Waiters, W. Wilder R. M., and Kepner E. J. The  
Suprarenal Cortical Syndrome with the Pres-  
entation of Ten Cases. *Ann Surg* 934, 100-  
107.

The records of ten cases in which the suprarenal cortical syndrome was present are reviewed. In the past two years, since the advent of active preparation of the cortical hormone, eight patients have been operated on with one operative death from an apparently accidental cause. There was one non-operative death. In the tenth case, in which operation was performed in 934, death occurred from what appeared to be suprarenal insufficiency. This fatality might have been prevented if active suprarenal cortical hormone had been available for temporary use. In five of the cases, suprarenal tumors were found in three diffuse hypertrophy and hyperplasia and in two, suprarenal glands of normal appearance. In three cases surgical removal of normal tumor was followed by rapid return to normal of previously abnormal physical metabolic conditions examined. In the other three patients, the tumor was not made. In two of the three cases of diffuse hypertrophy and hyperplasia (in one of which operation was not performed) autopsy revealed no abnormality of the pituitary body or ovaries. In the third case operation was performed recently the patient is now in good condition, and the roentgenogram of the sella turcica is normal. In one of the two cases in which the suprarenal glands were normal in appearance, the patient died at home several months after the operation and postmortem examination of the pituitary body revealed basophilic adenoma. In the other case the patient is living but the roentgenogram of the sella turcica discloses distortion suggesting pituitary tumor.

These cases indicate that surgical exploration of the suprarenal glands is advisable whenever the definite evidence of pituitary tumor is present. The hazard attending the removal of tumors or resection of large portions of hyperplastic suprarenal glands has been reduced to the minimum.

Abeshouse, R. B. Pyelographic Injection of the Perirenal Lymphatics. *Am J Surg* 934, 3-7.

Abeshouse discusses the relation of prelo-  
phatic backflow to chyluria, the anatomy of the  
lymphatics of the kidney and the mechanism of  
backflow from the renal parenchyma and pelvis

He states that injection of the perirenal lymphatics during retrograde pyelography, the so-called prelophatic backflow, is one of the rarest and most interesting phenomena in urology. From two cases he reports and eleven cases collected from the literature, he draws the following conclusions:

1. The phenomenon of prelophatic backflow can be distinctly demonstrated by injection of the renal and perirenal lymphatics during pyelography. While this phenomenon has been observed in thirteen clinical cases, attempts to produce it in animals have not been entirely successful.

2. Injection of the renal and perirenal lymphatics during pyelography occurs not only in the presence of parasitic and non-parasitic chyluria, but also in the absence of chyluria or a demonstrable chyluria.

3. The mechanism concerned in the pyelographic demonstration of the communication between the pelvis and the renal and perirenal lymphatics is disputed. Apparently, however, injection of these lymphatics is due to penetration of the pyelographic medium into congenital or acquired anomalous renal lymphatics.

4. The acquired type of anomalous renal lymphatics, which is usually associated with chyluria, is exemplified by the dilatation and tortuosity of the renal lymph vessels following obstruction of the thoracic duct by inflammatory, obstructive or neoplastic disease in the thoracic, mediastinal, peritoneal, or retroperitoneal region. The chyluria is the result of the rupture of one or more of the dilated tortuous lymph vessels which establishes a communication between the renal lymphatics and the renal pelvis. It is through the same points of rupture that the contrast medium penetrates and injects the renal and perirenal lymphatics.

5. The congenital type of anomalous renal lymphatics is probably present in cases of injected perirenal lymphatics without a demonstrable chyluria. Failure to demonstrate this type of anomalous renal lymphatics may be explained by the scantiness of our knowledge of the normal anatomy and physiological specimens showing such changes, and the anatomical difficulties encountered in injecting normal renal lymphatics. In this type, the anatomical variations in the course and structure of the renal lymphatics may produce direct communications between the renal lymphatics and the pelvis which will permit easy penetration of the pyelographic fluid.

6. Overdistention of the renal pelvis and excessive pressure during the pyelographic examination are not factors in the injection of the renal and perirenal lymphatics.

In conclusion the author says that his findings emphasize the need for further careful pycelographic studies in cases of parasitic and non parasitic chyluria of renal origin to determine the exact point of communication between the lymphatic and urinary systems and to increase our knowledge of the renal lymphatics

C. TRAVES STIMPIT, M.D.

Calef, C. Chromocystoscopy with Phenolsulphonphthalein in the Diagnosis of Kidney Function (*La cromocistoscopia alla fenolo sulfonilica dal punto di vista diagnostico e funzionale*). *Arch. Ital. di Urol.*, 1934, 11: 40

The author emphasizes the value of chromocystoscopy with phenolsulphonphthalein in the diagnosis of kidney function and presents tables showing his findings in tuberculous of the kidneys, calculus, pyonephrosis, nephropneumonia, pyelitis, pyelonephritis, hydronephrosis, various other conditions of the urinary tract and diseases not involving the urinary tract such as appendicitis and cholecystitis.

When the kidneys are normal the dye is eliminated in from three to five minutes. In the presence of a pathological condition its elimination is slower. When its elimination takes place in seven or eight minutes kidney function may still be considered good. While there may be slight retardation of elimination by the normal kidney when the other kidney is seriously diseased elimination requiring more than eight minutes usually indicates defective function.

When elimination by the normal kidney is retarded other tests should be made before radical operation is undertaken but when chromocystoscopy gives normal values no other tests are necessary.

Phenolsulphonphthalein is put up in sterile vials ready for use. Therefore it is unnecessary to prepare the solution fresh each time. Phenolsulphonphthalein is eliminated by the kidneys alone and therefore particularly well adapted for the determination of renal function. As it does not cause turbidity and is not deposited in a layer on the floor of the bladder, it does not interfere with cystoscopic examination. The theory that, as hematuria and various diseases of the bladder increase the red color of the tissues, the elimination of phenolsulphonphthalein, which is also red, it may be difficult to observe, is not valid as the red color of phenolsulphonphthalein is distinctly different from that of the tissues.

In all of the author's cases chromocystoscopy with phenolsulphonphthalein gave results in agreement with the clinical findings. Calef is therefore convinced that chromocystoscopy is of great value and that phenolsulphonphthalein is preferable to the other substances used for chromocystoscopy.

MIRIAM GROSS MORFAN, M.D.

Vermooten, V., and Neuswanger, C. H. The Effects on the Upper Urinary Tract in Dogs, of an Incompetent Uretrovesical Valve. *J. Urol.*, 1934, 32: 330

In the hope of obtaining dilatation of the ureters and incompetence of the ureterovesical valves pre-

luminary to an attempt at experimental reconstruction of the valves in dogs, the authors repeated the work of Gruber. Gruber reported that in the dog the amount of valve excised determines the degree of incompetence and this in turn bears a direct relation to the degree of ureteral dilatation and hydronephrosis obtained.

At intervals of from seven to eight weeks after the valve operation and just prior to the sacrifice of the animals the authors made cystograms with the use of a 20 per cent solution of sodium iodide. Their observations and conclusions, which were fundamentally different from those of Gruber, are summarized as follows:

1. Complete excision and incision of the ureterovesical valve in the dog will always result in incompetence manifested by regurgitation of the vesical contents up the ureter.

2. Regurgitation of uninfected urine up a normal ureter will not cause ureteral dilatation.

3. Regurgitation of infected urine up a normal ureter will not cause ureteral dilatation.

4. Regurgitation up an infected ureter will result in ureteral dilatation.

5. "Ascending" infection does not necessarily occur when infected vesical contents are regurgitated up a normal ureter.

6. Ureteral infection may occur as the result of ulceration of the ureteral epithelium.

7. This infection may progress by direct extension up and down in the loose areolar tissue of the tunica propria of the mucosa without the aid of the lymphatics.

8. If this infection extends up under the epithelium of the mucosa lining the renal pelvis and calyces pyelitis results.

9. Under such circumstances the ureteritis is usually limited to the tunica propria and does not extend into the ureteral musculature.

10. In no instance was periureteral inflammation observed.

C. TRAVES STIMPIT, M.D.

Uhle, C. A. W. Gonococcal Pyonephrosis. Report of a Case, with a Review of the Literature. *J. Urol.*, 1934, 32: 335

Uhle reports a case of gonococcal pyonephrosis in which the diagnosis was proved by smears, cultures, and fermentation and serological tests. The pus was obtained by pyelotomy. Uhle cautions against making a diagnosis by means of smears alone because by this method the gonococci may be confused with other diplococci.

The infection is frequently due to a mixed strain. The pathological changes do not differ from those of other acute or chronic infections except that sometimes the number of plasma cells is greater than in non specific infections. The portal of entry is doubtful.

Of the cases of gonococcal renal infections previously reported in the literature, only twelve met Uhle's requirements for proof.

FRANK M. COCHENS, M.D.

INTERNATIONAL ABSTRACT OF SURGERY

INTERNATIONAL A  
Roman, A. A Contribution to the Study of Sen  
oses of the Urter (Contributo allo studio delle  
stanzi dell'urter) Arch. ital. di anat. 934.  
40p.  
Roman reports nine cases of  
nural or vesical  
tion

Recent reports nine cases of stenosis of the intramural or vesical segment of the ureter. All of the patients were females. None of them had demonstrable foci of infection or gave a history of recent acute infectious disease. In eight, the stenosis was bilateral. In the author's opinion the cause of the intramural segment of the ureter is not clear.

In the author's opinion the cause of stenosis of the intramural segment of the ureter is an ascending infection from the genital tract. As this segment of the ureter is narrowed physiologically its involvement by inflammation may result in complete obstruction of the ureteral lumen.

BLADDER, URETHRA:

PETER A. ROSE, M.D.

BLADDER, URETHRA, AND PENIS

Bladder, Urethra, and Penis

Twenty-six cases of cystitis emphysematosa are on record. Nineteen of the patients were females. The authors report two cases in which the condition was found at autopsy. The authors' first case was that of a woman two years of age who died of pneumonia.

The authors first case was that of a woman sixty-two years of age who died eight hours after her admission to the hospital. The urine in this case had an acid reaction and sugar content of +4. The sediment of the blood was high, and the carbon dioxide combining power 8 mm Hg. At autopsy, the bladder was found distended by 400 ccm of turbid urine. The urine seemed clear and with gas bubbles ranging in size from that of a spout needle to that of a spit pen. The surface was irregular and reddish-brown from hemorrhages. The mucosa was 3 mm thick, and the wall was 1 cm thick, and the bladder floated in water. The mucosa was thick and showed marked congestion. The submucosa and serosa were normal. The ureters were normal. The lymphatics were recent and old hemorrhages. The cultures showed Gram-negative bacilli and destroyed. The same form was found in the second case, that of a 60-year-old woman, who died of a cerebral aneurysm.

In the second case, that of a female infant three months old, the urine was acid, showed abundant pus cells, and yielded positive cultures of bacillus coli communis. Following the administration of glucose + copper reduction was obtained. Examination of the urinary tract (autopsy) showed hemorrhagic cystitis with emphysema of the mucosa and ascending bilateral pyelonephritis. On the left

side there were two ureters and petros. The bladder mucosa was hemorrhagic. Solitary and multiple gas bubbles of pinkish and pinpoint size covered the entire mucosa, but were most numerous in the hemorrhagic zones. Gas vesicles were present in the submucosa or muscle layer. Cultures showed the bacillus coli communis.

CLAUDE D. PICKRELL, M.D.

CLARENCE D. PICKRELL, M.D.  
The Use of Radium in Carcinoma  
of the Bladder  
Rev. M. J. 1934, 134

The author calls attention to the great divergence of opinion among urologists regarding the use of radium in the treatment of carcinoma of the bladder. He believes that carcinoma should be thought to be inoperable when first seen all but hopeless. He reviews the early methods of radium treatment with their disadvantages and stresses the modern method of implanting radium and stresses the use of the cystoscope. He favors removal of the mass by diathermy. He favors removal of the tumor by introduction of the suprapubic root and the removal of radium seeds into the base of the tumor. He believes that radium seeds should be taken after forty days after resection. He believes that the first cystotomy should be done after four to six months after the first cystotomy. The operative mortality of radical cystectomy and transplantation of one ureter to the bladder is 10 to 15 per cent.

In conclusion, both clinical and experimental results of radium therapy. On the basis of his experience he believes that the implantation of radium seeds by means of the cytoplasts should be limited to cases of papillary carcinoma where the tumor is 3 cm in diameter. In others the tumor should be approached by the suprapubic route (that is, by peritoneotomy) if the suprapubic route is found to be feasible. Great care should be exercised as far as possible. Great care should be taken in selecting inoperable cases for radium treatment.

Donald E. Burns, M.D.

Salvaggi, G. Cancer of the Urethra in the Male (Nel  
caso dell'uretra macchiata) Arch. Ital. Urol. 1911  
437

[illegible]

Cancer of the male urethra is most common between the ages of fifty and sixty years, but is often found earlier. It develops most frequently in the

## GENITO-URINARY SURGERY

perineal portion of the urethra where the normal epithelial changes are most marked and strictures are most common. Before the tumor reaches the external surface of the body it is manifested only by an indurated mass of varying size along the urethra with or without changes in the adjacent tissues. After the skin has been perforated the lesion presents the usual characteristics of an ulcerated neoplasm to which may be added secondary infection from contamination by the urine. Thereafter, the tumor infiltrates and destroys the adjacent tissues.

Histologically, the tumors may be of mesenchymal or epithelial origin. Benign connective tissue tumors are rare. Malignant tumors, which are more common, are usually found in young persons and may occur even in babies. They include round-cell and spindle cell sarcomata, melanomata, endotheliomata, lymphosarcomata, and epithelial tumors. Malignant epithelial tumors may originate in either the epithelium lining the urethra or from some of its glands. They spread by direct extension. Metastasis to the nodes takes place late. According to Wasserman, it occurs in a third of the cases. Visceral metastasis, which is more frequent, occurs to the lungs, the skeleton, and, by retrograde spread, sometimes to the testicle. Selvaggi calls attention to the fact that the lymphadenopathy in the groins is often inflammatory.

The early symptoms, which are those of urethral obstruction, may be attributed by the patient to an old venereal infection. Later, the symptoms are those of an infiltrating, ulcerating, destructive lesion complicated by infection and often by a urinary fistula. Early diagnosis may be difficult, especially in cases with a pre-existing stricture. Urethroscopy, catheterization with an olive tipped bougie, or rectal examination may yield valuable diagnostic information. In the differential diagnosis, prostatic and perineal abscess, benign stricture, inflammatory lesions, and benign tumors must be excluded. An exact diagnosis is possible only by biopsy.

The prognosis of urethral cancer is poor as death usually results from a urinary complication. However, it is greatly improved by early diagnosis and correct treatment.

The most satisfactory treatment of cancer of the male urethra is radical surgical operation. In a certain few cases of well circumscribed lesions resection of the urethra may be done, but in most cases amputation of the penis, often with amputation of the scrotum and dissection of the inguinal nodes, is the operation indicated. In some cases prostatectomy or resection of the bladder may be necessary in addition. In many cases only a palliative operation for relief of the symptoms is possible. In this group irradiation in addition to the operation is of value. The author believes that dependence can be placed on radium or X-ray irradiation only for palliation. To date, the incidence of cure has been reported as about 10 per cent.

Selvaggi reports a case of fungating tumor of the urethra in a man fifty-seven years of age who had a post-gonorrhoeal urethral stricture. The diagnosis was made by biopsy. Radical operation supplemented by roentgen therapy was followed by a good result.

EUGENE T. LENNY, M.D.

Vintici, V., and Alterescu, H. A Case of Malignant Non-Carcinomatous Tumor Primary in the Corpora Cavernosa of the Penis with Visceral and Osseous Metastases (Un cas de tumeur maligne non carcinomateuse primitive des corps caverneux du pénis avec métastases viscérales et osseuses). *J. d'urolog. méd. et chir.*, 1934, 38, 27.

In a review of the literature the authors were able to find only thirty-five cases of lesions similar to the lesion in the case they report in this article. Their case was that of a man twenty-two years of age who first noticed a small firm tumor on the lateral side of the penis near the base in November, 1932. The tumor rapidly increased in size, and in February, 1933, when the patient first consulted the authors, it involved a considerable portion of the penis and there was pain on urination. A diagnosis of plastic induration of the corpora cavernosa was made and irradiation treatment was given. When the patient was seen again on April 24, 1933, he had lost 12 kgm. in weight, the local lesion had increased considerably in size, the penis had become conical and rigid, and there was involvement of the penoscrotal region and perineum. The urethra, corpus spongiosum, vas, testicles, and epididymis were apparently not involved, and the skin overlying the lesions was apparently normal. Urination was normal, but erection was extremely painful. General examination disclosed numerous metastases to the subcutaneous and deep tissues of the forearm and the legs, around the iliac crest, and in the lungs and bones. Laboratory examination was negative. Two attempts at biopsy were made, but were incomplete because of hemorrhage. Aspiration of one of the nodules disclosed numerous round cells which were undoubtedly malignant. Because of this finding and the extreme vascularity of the tumors the authors concluded that the neoplasm was a round-cell sarcoma developing in the fibrous tissue septa of the corpora cavernosa. The patient was given further X-ray treatment and sent home. He died several months later, soon after the occurrence of pathological fractures of the right humerus and tibia.

NATHAN A. WOMACK, M.D.

## GENITAL ORGANS

Carli, C. Torsion of the Spermatic Cord (La torsione del funicolo spermatico). *Arch. ital. di chir.*, 1934, 37, 209.

Carli reports a case of torsion of an undescended testicle in an infant eleven months old, reviews the literature on the condition, and discusses the peculiarities of his case.

Three days before his admission to the clinic, the child, who previously had been well, began to vomit and the mother noted that the undescended testicle in the right groin had become larger firmer and apparently painful. The application of hot fomentations by the mother was followed by periods of relief with intervals of exacerbation of the pain. The swelling in the groin remained about the same size.

On physical examination the left testicle as found to be of normal size and situated in the scrotum. The right half of the scrotum contained no testicle. In the right groin there was a mass the size of a pigeon's egg which, when manipulated, caused the child to scream.

A diagnosis of torsion of the spermatic cord of an undescended testicle was made and immediate operation advised. At operation the right testicle was found in the right inguinal canal. The tunica vaginalis was markedly distended and contained a sero-haemorrhagic fluid. The testicle and epididymis were purple. The spermatic cord was rotated 180 degrees from right to left. The torsion was above the vaginal sac. The scrotal ligament was absent. No hernia was present. On account of the degenerative changes in the testicle, orchidectomy was performed. Recovery was uneventful.

Histological examination of the testicle showed an interstitial haemorrhagic infiltration and reduction in the number and necrosis of the seminiferous tubules.

Carli states that torsion of the spermatic cord before the first year of age is rare, only about ten cases being on record. Extravaginal torsion is also unusual, only about twenty cases having been reported. He reviews the possible mechanism of torsion.

PETER A. ROSE, M.D.

Afjeström, T. Acute Tuberculous Epididymitis and Epididymo-Orchitis. *Acta chirurg. Scand.* 934 75 129

The author reviews 68 cases of acute tuberculous epididymitis and epididymo-orchitis of sudden onset in which the condition was accompanied by fever, deterioration of the general condition, pain, and redness of the scrotal skin, and in many respects resembled clinically acute septic and gonorrheal epididymitis and epididymo-orchitis. To compare this form of the disease with tuberculous epididymitis and epididymo-orchitis in general, he reviews also 500 cases of male genital tuberculosis collected from the literature.

Of 500 cases of tuberculous epididymitis and epididymo-orchitis, 7 per cent were acute from the beginning and presented the clinical picture observed in the author's cases.

The acute form of the disease may occur at any age, but in 48 per cent of the reviewed cases it developed between the 15th and 30th years.

Heredity is not an important factor. In 9 of the reviewed cases the cause was trauma; in 6, over exertion; in 3, influenza; in 5, gonorrheal urethritis, and in 1, cold.

Tuberculous changes in the prostate and seminal vesicles could be palpated in 66 per cent of the acute cases and in 6 per cent of the total number of cases of tuberculous epididymitis.

Tuberculous changes in other organs could be demonstrated in 25 per cent of the acute cases and 40 per cent of the total number of cases. In only a few of the acute cases were these changes serious.

The acute and apparently serious form of genital tuberculosis has a more favorable prognosis as regards life, but a greater tendency to become bilateral than tuberculous epididymitis in general.

In two-thirds of the acute cases a probable diagnosis can be made by rectal palpation and in some of these it can be confirmed by the demonstration of tubercle bacilli in secretion pressed from the prostate.

If the diagnosis is made early, operative treatment can be limited to epididymectomy. When the condition is advanced, castration must be performed.

To ascertain the factors determining the prognosis as regards life and recurrence in tuberculous epididymitis and epididymo-orchitis in general the author grouped the 500 cases reported in the literature according to the time that had elapsed between the onset of the disease and the patient's admission to the hospital and determined the percentage in each group in which there were palpable changes in the prostate and seminal vesicles, the percentage in which the condition became bilateral, the percentage in which tuberculosis changes occurred in other organs, and the mortality.

The prostate and seminal vesicles were involved in 60 per cent of the acute and subacute cases. In the chronic cases the incidence of such involvement is crossed with the duration of the disease.

Recurrence and bilateral involvement were most frequent in the cases with tuberculosis of the prostate and seminal vesicles.

The mortality depended entirely on other tuberculous changes in the body.

Marshall, A.: Abnormal Adrenal Tissue in the Epididymis. (See reports of cases of abnormal adrenal and epididymis) *Arch. int. med.* 1934, 437.

The author reports a case of abnormal adrenal cortical tissue in the head of the epididymis and reviews the literature on the condition.

His case was that of a man thirty-seven years of age who died of pulmonary tuberculosis. The adrenal tissue in the epididymis was found at autopsy. The nodule consisted of cells of the adrenal cortex surrounded by a fibrous capsule.

From his review of the literature the author concludes that accessory adrenal tissue is more or less common. It may be found in the vicinity of the adrenal gland itself, in the kidney or liver, along the spermatic vein, in the vicinity of the genital glands, in the ovary, in the region of the epididymis, in the pelvis, and in the region of the abdominal sympathetic nerves. Adrenal tissue around the abdominal sympathetics consists of medullary cells and has the

## GENITO-URINARY SURGERY

characteristics of chromaffin tissue, whereas aberrant adrenal tissue found elsewhere consists almost exclusively of cells of the adrenal cortex. The reported cases of cortical and medullary tissue in the same aberrant nodule are rare and doubtful.

The frequency with which adrenal cortical tissue is found in certain areas and organs, sometimes at a distance from the adrenal glands, is explained by the embryological vascular relationship of the adrenals and by dislocation of the adrenal tissue during early development before the two portions of the adrenal are fused into one gland. On account of involution and obliteration of many of the embryological vessels supplying aberrant adrenal glands with resulting atrophy of the adrenal tissue, accessory adrenal tissue is less common in adults than in infants a few months old.

Aberrant adrenal tissue maintains its function. This has been demonstrated clinically by cases in which the adrenal glands were completely destroyed without the appearance of Addison's syndrome or symptoms of adrenal insufficiency.

The aberrant adrenal tissue may undergo neoplastic changes and develop into neoplasms such as hypernephromata and Grawitz tumors.

PETER A. ROST, M.D.

Moszkowicz, L. The Origin of Cryptorchidism (Die Entstehung des Kryptorchismus) *Arch f klin Chir*, 1934, 179 445

As early as 1927, at the convention of Alpine surgeons at Innsbruck, the author expressed the opinion that cryptorchidism is the result of delayed sex determination due to an "intersexuality" in the sense in which that term is used by Goldschmidt.

In this article he presents further evidence in support of his theory. In a deformed newborn infant there was found a peritoneal duplication uniting both undescended testicles which could be described only as a ligamentum latum and had undoubtedly prevented the descent of the testicles. To solve the problem, the author examined a large number of embryos. He found that in embryos measuring 30 mm from vertex to coccyx sex characteristics were still not evident macroscopically, but that in embryos 40 mm long sex differences were distinctly apparent. In female embryos of the latter length the genital cord appears as a rather thick transverse ridge between the bladder and the rectum. In male embryos of the same age this cord is very much thinner and in the center is notched and bifurcated cranially.

As is well known, there occurs in the female embryo an extensive fusion of the muellerian ducts. As a result, the wolffian ducts which are enveloped by the same mesenchyme are drawn with them toward the midline. By this traction the cranial portion of the gubernacula and the caudal portion of the pronephron and the generative glands are also drawn closer to the center of the body. The generative glands are thereby moved from their vertical to a more horizontal position and are gradually with-

drawn from the influence of the gubernacula. The latter develop in their cranial portion into the ovarian ligaments and in their caudal portion into the round ligamentum latum.

In the male embryo large portions of the muellerian and wolffian ducts remain ununited, this fact accounting for the previously mentioned notching and bifurcation of the genital ridge. Accordingly, the gubernaculum is not drawn toward the middle and maintains its full efficiency with respect to the generative glands. It grows to a thick cord which enlarges the inguinal canal, thus facilitating the descent of the related testicle. The latter is merely hanging on a pedicle which is formed from parts of the muellerian and wolffian ducts and gradually becomes more and more attenuated. If a disturbance arises during this stage of growth—for example, if, in a maturing male embryo, female developmental characteristics at first predominate and therefore a progressive coalescence of the muellerian and wolffian ducts occurs—it will lead to the formation of a ligamentum latum binding both testicles and preventing their descent.

Asymmetry of this process would easily account for the unilateral inguinal testicle and for dystopia testis transversa.

If these theories are correct, still other deformities representing more marked disturbances of this type may occasionally be found in cryptorchids.

In the female, many deformities may be accounted for similarly by the predominance, for some length of time, of male developmental characteristics in the developing female embryo.

As these abnormalities may appear in several members of a family and are therefore inheritable, developmental anomalies may sometimes be found in female relatives of males with cryptorchidism.

Since the author has searched for such deformities in operations for retention of testicles in the inguinal canal he has observed in the case of a fifteen-year-old boy with bilateral cryptorchidism a shining, tendon-like thickening in the hernial sac which started from the medial margin of the testicle, entered the abdominal cavity in the form of a shining, tendon-like cord, and was apparently a rudimentary ligamentum latum. A ligament uniting both testicles and corresponding to the ligamentum latum was found also in two autopsies.

(W. MANDEL) MATTHIAS J. SEIFERT, M.D.

MacKenzie, D. W., and Ratner, M. Malignant Growths in the Undescended Testis. A Review of the Literature and a Report of Two Cases. *J. Urol*, 1934, 32 359.

The authors report two cases of malignant growths in undescended testicles. They state that the occurrence of such changes in either the abdominal or the inguinal undescended testicle is rare, and that the arguments advanced to prove that undescended testicles are predisposed to malignant changes are based on statistics which often are contradictory.

They have found that malignancy develops in an abdominal testicle in only 1 of 50,000 cases of abdominal cryptorchidism. They therefore believe that orchidectomy should never be performed merely to prevent malignant degeneration.

The pathological character of growths in undescended testicles is the same as that of growths in normally placed testicles. The symptoms depend on the location of the testicle. If the testicle is in the groin the patient complains of a mass and feeling of heaviness in the groin, but if the testicle is in the abdomen there are no symptoms until late, when an abdominal mass becomes apparent. Often the symptoms due to metastases are the first to appear.

In cases of malignant growths in undescended testicles MacKenzie and Kistner precede orchidectomy by a course of deep X-ray therapy and follow it by several courses of deep X-ray therapy given over a long period of time.

FRANK M. COOPER, M.D.

Donati, D. Fibrosarcoma of the Tunica Vaginalis of the Testicle, a Clinical and Pathological Study (Fibro-sarcoma della vagina del testicolo. Studio clinico ed anatomicopatologico). *Arch. ital. di med.* 1934, 47.

Connective tissue tumors originating from the fibrous tunica which surround the testicles or from the adipose and fibrous tissues which separate and surround the various elements of the testicles or cord are very rare. In general they run a benign course. An exact distinction between tumors of the cord and tumors of the sheaths of the testicle is often very difficult to draw because cord tumors often begin in the cord below the inguinal canal, frequently near the true sheath of the testis, and tumors of the tunica vaginalis may grow between the visceral and parietal leaflets around the posterior fascia of the epididymis or cord. However tumors of the cord are much more frequent than tumors of the sheaths of the testicle.

In discussions of the histology of tumors of the spermatic cord and tunica vaginalis, there have been described several types of tumors of connective tissue origin, fibromata, lipomata, myxomata, mixed tumors, tumors undergoing malignant degeneration, fibrosarcomata, and sarcomata. Even the malignant tumors have a slow course and their histological examination seldom shows very definite active atypical proliferation of the cells.

Before reporting the findings of his study of tumors of the sheaths of the testicle Donati reviews briefly the normal anatomy of these sheaths. He states that the tunica vaginalis propria, the tunica fibrosa, and the interposed cellular tissues may all be the sites of neoplasms. Tumors involving these sheaths always have an insidious onset and grow slowly. Sometimes they follow trauma. They may reach considerable size without causing symptoms and then cause only mechanical symptoms. They are usually unilateral. They do not metastasize and, if removed, do not recur.

Donati reports a case which he considers noteworthy because of the rarity of the type of tumor found, the presence of multiple tumor masses, and the sites of the neoplasms. There were several neoplasms in the tunica vaginalis propria, involving especially the parietal leaf surrounding the epididymis and cord, and also a number of masses between the tunica propria and the tunica fibrosa. External to the tunica vaginalis commune there were masses of fat encapsulated by a fibrous sheath. The patient was a man seventy years of age who first noticed a slowly growing symptomless lump in the left testicle two years before he entered the hospital. At the time he entered the hospital the neoplasm had reached such a size that its weight caused discomfort. Exploratory puncture of a cystic area of the tumor evinced about 10 c.c. of fluid which contained many leucocytes, a number of crystals, numerous large round cells with clear protoplasm and without vacuoles, and some cells with irregular outlines in which granular fatty degeneration was seen. At operation the tumor of the left testicle, all of the scrotal sac, and a considerable portion of the cord were removed. The tumor measured 12 cm. in length and 8 cm. in thickness and weighed 700 gm. On microscopic examination it was found to be fibroma showing areas of fibrosarcoma with polymorphous cells.

LORENZ T. LEWIS, M.D.

# MISCELLANEOUS

Wolgensinger and Calson: The Search for Koch's Bacilli in the Urine (De la recherche des bacilles de Koch dans les urines). *J. d'anal. med. et chir.* 1934, 37, 459.

The authors review the four principal methods for finding tubercle bacilli in the urine: (1) direct examination after centrifugation and staining, (2) inoculation of guinea pigs, (3) examination after enrichment, and (4) culture on microculture.

The reported incidence of positive results from direct examination in proved cases varies from 14 to 37.95 per cent.

According to Marion, guinea-pig inoculation yields positive results in 90 per cent of cases. However Calmatt has called attention to instances of spontaneous tuberculous infection of guinea pigs and rabbits, thereby demonstrating that this method is not free from the possibility of error. Another disadvantage of the procedure is the time it requires. The authors abandoned the method in 95.

The authors object to microculture because it is difficult and requires from nine to twenty-seven days.

They recommend most highly the methods of concentration, particularly the Ellermann-Eriksen method of autodigestion which they supplement by direct examination of the sediment. In fourteen years they have obtained positive results by the combination of these two methods in 95.45 per cent of cases. They believe that these methods are suffi-

ciently accurate to rule out or prove the presence of unilateral or bilateral renal tuberculosis. Their technique is as follows:

All utensils are carefully cleansed prior to use. The urine is centrifugalized at 4,500 revolutions for fifteen minutes. The sediment is stained with hot Ziehl-Nielsen stain for five minutes and then destained with nitric acid and alcohol to which a little picric acid has been added and counter-stained with methylene blue. The picric acid is used to decolor the smegma bacillus. A careful systematic study of the preparation is next made. If the microscopic examination is negative, the Ellermann-Erlandsen procedure of autodigestion is carried out in the following manner:

The sediment obtained by the previous centrifugalization is diluted with a 1:400 solution of sodium carbonate and incubated at 37 degrees C. for twenty-four hours. It is then centrifugalized for fifteen minutes at 4,500 revolutions. The sediment is again diluted with the solution of sodium carbonate and placed in a boiling water bath for five minutes. After cooling, it is again centrifugalized for fifteen minutes at 4,500 revolutions and the sediment stained as described for the direct examination.

The authors conclude that the method is rapid and certain if the described technique is followed and if a careful study of the stained smears is made by a competent bacteriologist. MAX M. ZINNINGER, M.D.

Le-Roy, C. M. Colon Bacillus Hæmaturia (Le ematune da colibacillo). *Arch. ital. di urol.*, 1934, 11: 311.

The author reports twenty-five cases of hæmaturia due to lesions in the urinary tract produced by the

colon bacillus. In such cases the colon bacillus reaches the urinary tract from the intestine by way of the blood stream. It may enter the blood stream through extremely minute intestinal lesions. Hæmaturias due to the colon bacillus have no particular characteristics which permit their differentiation from hæmaturias due to other causes. In the majority of cases of colon-bacillus hæmaturia the lesion responsible for the bleeding is in the kidney, but not infrequently the bladder is involved either alone or with a kidney.

Hæmaturia due to the colon bacillus may result from the toxins alone, under which circumstances the organisms are infrequent in the urine, or may be associated with a pure colon-bacillus bacilluria or a more or less intense pyuria. The fact that colon bacilli often pass through the urinary tract without producing a pathological lesion has not been explained. It is possible that when this occurs the virulence of the organisms is low.

The pathological changes produced by the colon bacillus in the urinary tract vary from a simple renal congestion with zones of interstitial nephritis to the development of frank suppuration with the formation of abscesses in the kidney or bladder. The so-called purpura of the bladder mucosa often seen on cystoscopic examination may represent such an inflammatory hæmorrhagic lesion.

The diagnosis of colon bacillus hæmaturia may be difficult. Bacteriological examination of specimens of ureteral urine is most important. In general the prognosis is favorable. The treatment should be directed principally to the intestinal tract, the source of the infection.

A. LOUIS ROSE, M.D.



# SURGERY OF THE BONES JOINTS MUSCLES, TENDONS

## CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

McGaw W H., and Harbin, M. The Role of Bone Marrow and Endosteum in Bone Regeneration. An Experimental Study of Bone Marrow and Endosteal Transplants. *J Bone & Joint Surg* 1934, 6 816

Osteogenic properties have been ascribed in all portions of bone, but especially cortical bone with or without periosteum has been advocated for bone transplants. Apparently no one has previously suggested that marrow tissue alone might be used as a free graft to stimulate or hasten osteogenesis. The authors resected portions of the fibula with periosteum from the legs of several dogs and transplanted curetted fragments of autogenous ilial bone marrow into the defects. New bone began to form within from six to fourteen days. At sixty days, a medullary canal and cortical condensation with fusion to the shafts were present in the roentgenogram. In control fibulae in which similar resections were done without the use of transplants no bone regeneration occurred.

CASPER C. GUY, M.D.

Bry E. A., and Hench P. S. Tuberculous Rheumatism. A Re-evaluation. *J Bone & Joint Surg* 1934, 6 859

The condition discussed by the authors is a form of polyarthritides resembling in some cases acute rheumatic fever and in other cases chronic atrophic arthritis, but bearing some suggestion that its cause may be tuberculous. Familial tuberculous associated with visceral tuberculosis, the demonstration of Koch bacilli in the synovial fluid and the blood stream, positive results of inoculations of guinea pigs with joint fluid, and in some cases the presence of typical joint tuberculosis before coincident with, or subsequent to the development of the polyarthritides have been considered evidence for the diagnosis of tuberculous rheumatism. The condition is thought to be due to tuberculous toxin from distant foci.

Filterable virus, an attenuated form of tubercle bacilli, or an allergic reaction. Therefore true tubercles are not an expected finding and, when present, are attributed to superimposed tuberculous arthritis rather than to tuberculous rheumatism. Focal collections of round cells, plasma cells, and histiocytes somewhat resembling tubercles and Aschoff nodules isolated instances of necrosis and thickening and vascularization of the vessels and the presence of giant cells and endothelial cells have been recorded in reports of studies of the synovial membrane in cases of tuberculous rheumatism. These have been interpreted as representing either a transition stage between simple inflammatory lesions and

tuberculous or an allergic manifestation of the latter. If typical tuberculous arthritis develops in a joint which was previously the site of atrophic polyarthritides the characteristic pathological changes may be due to transformation within the joint of the virus form of infecting agent into virulent tubercle bacilli. The virus form is thought to be responsible for the former ganglionous form of tuberculous in guinea pigs, in which inoculation of fluid from patient with atrophic polyarthritides may produce only enlargement of regional lymph nodes. Subsequent injection of the macerated lymphoid tissue into a second or a third guinea pig may lead to the production of typical tuberculous and to the demonstration of the presence of Koch bacilli in the viscera of the animals.

A large number of competent investigators do not recognize the syndrome of tuberculous rheumatism, arguing that there is no adequate clinical method of identifying it, no consistent roentgenographic, experimental, or laboratory evidence of the condition, and no consistent demonstration of its supposedly characteristic microscopic pathological changes.

A statistical study of a series of 50 cases of acute rheumatic fever and 50 cases of chronic atrophic polyarthritides revealed no significantly higher incidence of familial tuberculous or associated visceral tuberculosis than that found in a group of 50 control cases. Of series of 25 cases in which diagnosis of chronic atrophic polyarthritides was made and the pathological characteristics of a single joint were determined by microscopic examination of tissue or inoculation of guinea pigs, definite tuberculosis was found in 8. In the remainder there was no definite evidence of an intermediary stage between simple inflammation and tuberculosis. In each of the 8 cases, tuberculous involvement of the joint was suspected prior to examination of tissues or inoculation of guinea pigs, but its association with multiple arthritides was confusing. Further investigation of cases of acute rheumatic fever and chronic atrophic polyarthritides with regard to tuberculosis as a cause will be required to determine the acceptance or rejection of the syndrome of tuberculous rheumatism. The authors conclude that, as yet, there is no incontrovertible proof of such an entity.

Ferguson, A. B. and Howarth, M. B. Coxa Plana and Related Conditions of the Hip. I. Classification and Correlation of These Conditions. II. A Study of Seventy-Five Cases of Coxa Plana. *J Bone & Joint Surg* 1934, 6 781 789

In the first part of this article the authors discuss the classification and correlation of coxa plana, slipping of the upper femoral epiphysis, osteochondritis dissecans, certain types of chronic degenerative

arthritis, and a condition not previously identified as a clinical entity, to which the name "coxa magna" is given. All of these conditions result from a circulatory disturbance in or adjacent to the head of the femur, which is referred to as "ischæmia."

In the authors' cases of coxa plana and related conditions ischæmia was found to be due to the following factors: (1) inflammation in the hip joint, (2) inflammation or tumor adjacent to the joint, usually in the neck of the femur, (3) fracture or epiphyseal separation in the neck of the femur, (4) trauma to the head of the femur, or (5) tension of the soft tissues about the neck of the femur.

The type of condition caused by ischæmia at the head of the femur depends upon the vulnerability of the parts of the hip. In the first decade of life the substance of the head of the femur is more susceptible to the influence of a circulatory disturbance than the growth disk, whereas in adolescence, the growth disk is more likely to be affected by such a disturbance. Vulnerability of a given part of the hip occurs two or three years earlier in girls than in boys.

Ischæmia due to inflammation in the hip joint may cause coxa plana, slipping of the epiphysis, coxa magna, or degenerative arthritis. Coxa plana due to such ischæmia is the most common type. The onset of symptoms occurs between the third and twelfth years of age.

Ischæmia due to inflammation or a tumor adjacent to the joint may cause coxa plana, slipping of the epiphysis, coxa magna, or chronic arthritis. Coxa plana from such ischæmia occurs usually between the fifth and tenth years of age, whereas slipping of the epiphysis occurs between the tenth and sixteenth years of age.

Ischæmia due to fracture or epiphyseal separation at the neck of the femur may cause coxa plana and possibly coxa magna.

Ischæmia due to trauma to the head of the femur may cause coxa plana or osteochondritis dissecans.

Ischæmia due to tension of the soft tissues about the neck of the femur may cause coxa plana and may be a contributing factor in ischæmia due to fracture or epiphyseal separation at the neck of the femur or an additional factor, favored by the method of treatment or immobilization, in conditions arising from ischæmia of other types. It occurs usually between the first and sixth years of age and most often in cases of congenital dislocation of the hip in which open or closed reduction has been attempted or obtained.

Coxa plana occurring between the ages of three and twelve years is variously described in the literature as "coxa plana," "Legg's disease," "Perthes' disease," "Calvé's disease," "osteochondritis deformans juvenilis," "pseudocoxalgia," and "aseptic necrosis of the upper femoral epiphysis." It is characterized roentgenographically by flattening of the crest of the upper femoral epiphysis with widening of the joint space and changes in the density and evenness of ossification of the epiphysis and the proximal end of the neck of the femur.

In the seventy-five cases of coxa plana reviewed by the authors the condition followed subacute arthritis. Sixty-four (85 per cent) of the patients were males. Both hips were involved in eight cases, the left hip alone was affected in thirty-six, and the right hip alone was affected in thirty-one.

In twenty-six (46 per cent) of fifty-six patients with a history of tonsillar infection, disease of the tonsils was found at the time of, or shortly before, the onset of the coxa plana. In four patients other infections were discovered. Thirty-three per cent had had an infection several months before the onset of the coxa plana. These facts suggest that infection may be a causative factor.

The age at the onset of the symptoms in the hip ranged from three to twelve years. The average age was seven years. The onset was between the ages of six and ten years in 61 per cent and between the ages of three and six years in 26 per cent. Therefore the condition began between the ages of three and ten years in 87 per cent. Of the cases seen before the residual stage, the onset occurred after the age of ten years in only three.

The predominating initial symptoms recalled by the patients were lumping and pain, each of which occurred in more than half of the cases and both of which were present in nearly half. Limitation of motion was noticed by one-fourth of the patients. Disability of consequence was uncommon.

The course of coxa plana may be divided into three stages—the active, the reparative, and the residual. Each stage generally begins and ends later in the bone than in the soft tissues.

The active stage is manifested clinically by soft-tissue inflammation with pain and limitation of motion and roentgenographically demonstrable soft-tissue swelling. These manifestations are often observed before changes in the bone are demonstrable roentgenographically or pathologically.

The reparative stage is characterized clinically by soft-tissue healing and scarring associated with a decrease in the pain and spasm and an increase in the range of motion. Its termination is marked by absence of pain and spasm. Ordinarily it is completed clinically much earlier than roentgenographically.

The residual stage is characterized clinically by the absence of spasm. It precedes by months or years the roentgenographic and pathological residual stages which are characterized by the completion of repair in the affected bone. Shortening and atrophy usually persist. In many cases the patients are able to take part in strenuous exercise.

In the cases reviewed twenty-one hips were exposed at operation. Six were in the active stage of the condition, two in the early stage of repair, and the others in the late stage of repair.

In the active stage the synovial membrane was always thickened, soft, fragile, very vascular, and often irregular with villus formation. The periosteum was usually thickened and oedematous. The capsule was usually thickened, slightly oedematous, and more vascular than normal. The contour and ap-

pearance of the white portion of the cartilage of the femoral head were normal. The synovial fluid was not abnormal. Microscopic examination showed that the synovial membrane was usually oedematous, contained clusters of lymphocytes and as often villous. In most cases the capsule and peritoneum were chronically inflamed.

In the hips exposed in the reparative stage the synovial membrane was smooth, inelastic, tough, thin, ivory-colored, and avascular. The peritoneum and capsule were scarred and inelastic. The cartilage of the head of the femur as flattened in only four cases, but in several it had proliferated at the margin with the development of pannus. The cartilage was otherwise normal in appearance as far as it could be seen without dislocating the hip. On microscopic examination the soft tissues were found to be extensively scarred and to contain thick walled vessels with small lumina. In several instances there was evidence of degeneration in the cartilage from the margin of the head.

Cultures taken from four hips resulted in no growth. The Mantoux or von Pirquet test was done in twenty five cases. The results were positive in six, doubtful in two and negative in seventeen.

Coxa plana is characterized roentgenographically by the development of areas of increased density within the femoral head (followed by irregular ossification and subsequent repair in the previously dense areas and accompanied by a decrease in the vertical diameter of the affected areas, overdevelopment of the cartilage, and broadening of the head and neck.

In the case of a child between the ages of three and twelve years who lumps and complains of pain in the hip, thigh, or knee the hip should be carefully examined for limitation of motion, particularly limitation of internal rotation and abduction, and for spasms and pain at the limits of motion. If the findings are positive, roentgenographic examination, by which the diagnosis of coxa plana can almost always be established, is indicated.

The general treatment of coxa plana should include the elimination of foci of infection and treatment of active infections that may arise.

In the early or active stage the primary essential in the treatment is rest and relief from weight bearing. As *real rest* is best obtained by keeping the child in bed without traction or brace. However in the presence of acute pain and spasms, simple adhesion or ankle traction may be used for short time for their relief. When necessary, it may be employed also for restraint. As *real*, however traction should be avoided if possible. The authors advise against the use of casts, and particularly against the use of traction braces, because while they provide rest, they favor subsequent limitation of motion. Rest should be maintained as long as definite pain on motion and spasms persist and until roentgenographic examination indicates that repair has progressed sufficiently for the ossified femoral head to support the articular cartilage on weight bearing. Stretching and forcible manipulation should

not be done in either the active or the reparative stage.

The authors describe the technique of the drilling operation. In fifteen hips in which this was done repair in the bone began immediately, no new areas of increased density developed, the reparative stage was greatly shortened, and the clinical condition was improved. The hip may become perfectly normal clinically and roentgenographically a result which has not been observed in patients not operated upon except in a few cases.

The drilling operation is as yet experimental and its value has not been fully determined. It is technically difficult and associated with the possibility of serious damage to the hip. However if it is properly performed when the inflammation in the hip is not too active it will hasten repair and prevent further deformity of the head of the femur.

In the reparative stage, no treatment is indicated. Activities which would cause severe wrench to the hip—such as jumping from a height, skating, and playing football—should be prohibited. If there is much limitation of motion, rest in bed for two or three months should be tried.

In the residual stage, treatment should be directed only at the result of the disease. It may consist of subtrochanteric osteotomy, reconstruction, arthroplasty or excision. NORMAN C. BLOOM, M.D.

#### SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Bosman, E. J.: A New Attempt at Treatment of Chronic Osteomyelitis. *J Bone & Joint Surg* 1934, 16, 205.

Bosman states that an area of aseptic bone necrosis anywhere in the body may be successfully treated by connecting the necrotic segment with an adjacent living segment of bone by drill channels. Good results have been obtained by this treatment in Legg Calvé-Perthes disease, osteochondritis dissecans, Osgood-Schlatter disease, intracapsular fractures of the neck of the femur and slipping and slipped upper femoral epiphyses. In all of these conditions aseptic bone necrosis is the main feature.

The observations of Ashkenazi, Thiemer, Seaton, Freund, and Cordes have demonstrated definitely that the chief factor in the spontaneous healing process of aseptic bone necrosis brought about by any cause is substitution of living bone for the necrotic bone which is effected by the slow penetration of tissue elements and capillaries of the adjacent living bone. The drilling of channels into the necrotic area opens broad venous favoring this invasion by new vessels. Bosman reports a case of aseptic bone necrosis illustrating its effectiveness.

In comparing the characteristics of aseptic bone necrosis and necrosis of bone following septic processes such as suppurative osteomyelitis, Bosman found that, in the last analysis, there is no difference between them. Because of this finding and because the natural healing process in both aseptic and septic

necrosis appears to be analogous, he concluded that septic necrosis might respond favorably to the treatment found effective in aseptic necrosis. He therefore attempted to induce substitution and revitalization of necrotic areas of bone in chronic osteomyelitis by connecting the involved areas with living bone segments by saw cuts and drill channels. He reports his first two cases in which this procedure was carried out. When the patients were re-examined one and three quarters years and one year after the operation, respectively, the result was found to be successful.

NORMAN C. BULLOCK, M.D.

Delchef, J., and Roudil, G. The Treatment of Spastic Paralysis (Le traitement des paralysies spasmodiques) *Rev d'orthop*, 1934, 41 434

The authors review at length the various methods of treatment used for spastic paralysis, surgical and non-surgical. They note that the most common cause of spastic paralysis is intra-uterine infection, chiefly syphilitic, and obstetrical trauma. Children with spastic paralysis tend to show spontaneous improvement. This should be aided by re-education by exercise, massage, and physical therapy. These measures are the indispensable basis of any form of treatment. Cases of spastic paralysis should be treated by those especially trained for the work.

In the milder cases treated from the beginning, re-education and physical therapeutic measures, combined with anti-syphilitic treatment and sedatives as indicated, are sufficient. In some cases with marked motor incoordination the use of suitable orthopedic apparatus facilitates re-education. In cases of longer duration with established deformity the use of orthopedic apparatus should be supplemented by such operative measures as lengthening of muscles, tendon and nerve resection, or tendon transplantation, especially on the upper extremities, and surgical correction of bony deformities. In severe cases in which spastic phenomena are marked and those complicated by choreo athetosis or spasmodic torticollis an operation such as nerve-root resection or ramisection is indicated. In the treatment of any case the measures must be carefully chosen and wisely combined. Both pessimism and too great optimism as to the final outcome must be avoided.

ALICE M. MEYERS

Bosworth, D. M. Autogenous Bone Pegging for Epiphysitis of the Tibial Tubercle. *J Bone & Joint Surg*, 1934, 16 829

The author reports four cases in which autogenous bone pegging of the tibial tubercle was done for epiphysitis which did not respond to conservative treatment. In this procedure a skin incision is carried downward over the lower third of the ligamentum patellæ and tibial tubercle and then extended medially downward. The periosteum is split and laid back. Two match stick bone pegs 4 cm. long are cut with an electric saw. The central cut divides the two pegs and slants obliquely so that each peg is larger at its base than at its tip. Two holes are drilled—one, close to, but not touching the

proximal tibial epiphyseal plate and slanting slightly upward and outward, and the other distal to the plate and slanting slightly upward and inward. The pegs are then driven in so that they set snugly and the projecting ends are cut off. After the operation the leg is immobilized in a long plaster boot for two and a half weeks. At the end of that time walking is permitted. The author has found that in cases of epiphysitis of long standing such treatment results in healing and ossification of the tubercle.

ROBERT C. LONERGAN, M.D.

Adamesteanu, C. The Static Conditions of the Foot After Astragalectomy (Les conditions statiques du pied après l'astragalectomie) *Rev d'orthop*, 1934, 41 485

Astragalectomy was first practiced by Fabricius de Hilden in the sixteenth century. The functional results of the operation are in general not entirely satisfactory. There are three points at which the tibia may be mortized into the tarsus to form a new tibiotarsal joint—behind, above, and in front of the sustentaculum tali.

In a study of the statics of the foot according to the rules established by Destot, the author found that, according to those rules, the retrosustentacular operation is followed by talipes calcaneus, the suprasustentacular operation, by slight talipes calcaneovalgus, the presustentacular operation, by no disturbance of transverse equilibrium but by a slight tendency toward equinus. Clinically, however, there are factors that alter these rules which were established by studies on the cadaver. In a study of clinical cases the author found that the retrosustentacular operation caused talipes cavus and the suprasustentacular operation slight talipes cavus and varus, whereas after the presustentacular operation the position and function of the foot were practically normal.

To obtain the best results from the presustentacular operation some modifications should be made in the classical procedure. Section of all of the ligaments inserted at the tips of both malleoli is absolutely necessary, and sometimes also section of the posterior part of the capsule. The inner and lower border of the joint surface of the scaphoid should be removed with bone forceps to permit firmer fixation of the bone in the mortise, and the peroneus tendons should be replaced in front of the external malleolus.

AUDREY GOSS MORGAN, M.D.

## FRACTURES AND DISLOCATIONS

Bancroft, F. W. The General Question of the Emergency Treatment of Fractures. *Ann Surg*, 1934, 100 843

The author presents a brief résumé of the work done by the Committee on Fractures of the American College of Surgeons. This Committee functions through three main agencies: the annual meeting of the American College of Surgeons, where a fracture symposium is held, the annual meeting of the Gen-

eral Committee on Fractures, at which the reports of sub-committees are presented and regional groups. By these means adequate first-aid methods for the handling of fractures are being taught not only to doctors and medical students, but also to boy scouts, undertakers, and police and fire department men and an attempt is made to reduce the period of disability and economic loss in cases of fracture.

BARBARA B. STODOL, M.D.

Santi, E.: Fractures of the Upper Extremity and the Shaft of the Humerus in Childhood (*La fratture dell'estremità superiore della diafisi dell'omero nell'infanzia*) *Chir. ital.* 924, 10: 648

The author presents a detailed analysis of fractures of the upper extremity and the diaphysis of the humerus in childhood based on statistics from the Children's Surgical Clinic of the University of Florence over a period of twenty years. Of a total of 365 fractures seen in the period from 1909 to 1933, 465 were fractures of the humerus. Thirty-eight of the latter involved the upper extremity, 64 the diaphysis, and 363 the lower extremity. Santi discusses the mechanism, pathological anatomy, symptoms, and differential diagnosis of fractures of the upper extremity of the humerus. As treatment he advocates vertical or horizontal traction with weights maintained for from fifteen to twenty days and followed by muscle re-education. He discusses epiphyseal separations, fractures of the diaphysis, and oblique fractures in somewhat less detail.

BARBARA B. STODOL, M.D.

Soto-Hall, R., and Haldeman, K. O.: The Treatment of Fractures of the Carpal Scaphoid. *J. Bone & Joint Surg.* 924, 6: 822.

Isolated fractures of the carpal scaphoid are of three types. The most common is an entirely intra-articular fracture occurring through the middle of the body or neck. The next most common is an extra-articular avulsion fracture of the tuberosity which heals with bony union in five or six weeks. The least common is a fracture associated with severe comminution and deformity.

Recent fractures of the carpal scaphoid should be treated by fixation with the wrist in extension of from 30 to 40 degrees and complete radial flexion and with inclusion of the thumb in the position of extension and abduction. The immobilization should be maintained for a minimum of from seven to nine weeks, but with liberation of the thumb at the end of five weeks. For cases of long-continued non-union the authors advocate the drilling of multiple holes through both fragments. The postoperative treatment should be the same as for fresh fractures. Of seven cases treated in this manner bony union resulted in five. For fractures with marked comminution and deformity the authors advise complete excision of both fragments. They believe that after total removal it is essential to immobilize the wrist in complete ulnar flexion for at least five or six weeks to allow the cavity to become filled with strong distal tissue and to permit the ligamentous and osseous structures to obtain proper attachment.

BARBARA B. STODOL, M.D.

# SURGERY OF THE BLOOD AND LYMPH SYSTEMS

## BLOOD VESSELS

Dixon, O J Experimental Studies in Vascular Repair *J Am M Ass*, 1934, 103 1129

The author concludes from experimental observations that in injuries of the sigmoid sinus the intravenous use of a strip of viable sternocleidomastoid muscle is the best means available for the control of hæmorrhage and may be expected to be followed by recanalization with complete restoration of the function of the sigmoid sinus as a blood carrier

J THORNWELL WITHERSPOON, M D

Gilbert, R, and Babaïantz, L Roentgen Therapy of Vasomotor Disturbances of the Extremities (La roentgentherapie des troubles vaso-moteurs des extrémités) *Rev méd de la Suisse Rom*, 1934, 54 725

For the treatment of vasomotor disturbances of the extremities the authors recommend roentgen irradiation of the sympathetic nerves in addition to other forms of therapy. They review reports of the results of roentgen irradiation of the sympathetic and parasympathetic nerves in clinical practice and experimental investigations. This treatment has been used for neuralgia, pruritus, and dermatitis. In experimental studies it has been found that the excitability of the nerves and the tone and motility of the capillaries can be altered. In the authors' opinion the results are best explained by the assumption that the roentgen therapy is neither constantly vasoconstricting nor constantly vasodilating in its action, but may be either one or the other, depending on which effect is necessary for restoration of the proper balance of the disturbed vasomotor reflexes. The dosage required is small. The authors call the described irradiation "functional" or "indirect" irradiation to differentiate it from the direct irradiation used in the treatment of neoplasms which aims at the destruction of cells. Two general methods are used. (1) irradiation of the sympathetic trunks in the cervical and lower dorsal-lumbar region or of the peripheral branches in the axilla, groin, or popliteal space, and (2) irradiation of the suprarenal regions and the adjacent ganglia. The authors present a table based on 5 reports covering a total of 155 cases of vascular disturbances of the extremities of many kinds (Buerger's disease, Raynaud's disease, gangrene of all types, erythromelalgia, acrocyanosis, and trophic disturbances). The number of patients cured or benefited ranged from 60 to 96 per cent.

The technique of the irradiation varies. In general, semi penetrating rays moderately filtered with from 2 to 5 mm of aluminum are used for the peripheral nerves and similar rays filtered with 0.5

mm of copper are used for the nerve trunks. The total dose varies from 500 to 800 r spread over from two to three weeks and averaging 175 r per treatment per field. Such a series of irradiations may be repeated after an interval of two of three weeks. As a rule, irradiation of the symptoms is slow, peripheral and if amelioration of the symptoms is slow, peripheral irradiation is done. For the upper extremities the irradiation is given over the cervical spine and the first and second dorsal vertebrae, generally through 2 lateral portals. For the lower extremities it is given from the tenth dorsal to the first lumbar vertebra over an area 12 cm wide on each side of the midline.

The authors state that they have tried the method in 11 cases (3 additional cases are added in a footnote). Six cases are not reported in detail for various reasons (failure of follow up, death, treatment given too recently, patient admitted to the hospital in extremis). The remaining 5 cases included 1 case each of obliterating arteritis, circulatory disturbances with painful cramps and gangrene, senile gangrene of the heel, trophic ulcer of the foot, and diabetic gangrene. All were treated by irradiation of the suprarenal region, and in all a cure or marked improvement resulted. Photographs of 2 patients showing healing are presented. The article has an extensive bibliography. MAX M ZENINGER, M.D.

Carlson, H A Obstruction of the Superior Vena Cava. An Experimental Study *Arch Surg*, 1934, 29 669

In experiments on dogs the author obstructed the superior vena cava above, below, and including the azygos vein to determine the tolerance of the animals to such obstruction, to measure its effects on the venous and arterial pressure, and to note the collateral circulation.

He found that the dogs tolerated obstruction above the azygos vein, but that, particularly when it was produced in one stage, they did not tolerate obstruction below the vein. Immediately after the obstruction of the superior vena cava, marked cyanosis of the upper part of the body resulted. This disappeared gradually in about twenty-four hours as the collateral circulation developed. Eventually the collateral circulation compensated for the obstruction and the animals appeared normal. The paths of collateral circulation are described in detail. When the lateral circulation was above the azygos, the azygos and its branches formed the chief trunk for the return of blood to the heart from the upper part of the body and the lower abdominal collateral veins were not very important. When the obstruction included the azygos vein, the superficial and deep abdominal vessels and the vertebral plexus were of much

greater importance. As the artery as blocked, the blood returned to the heart through the inferior vena cava. The renal and internal spermatic veins are more important in man than in animals.

The venous pressure was increased as a result of the obstruction, but as the collateral circulation was established it returned to normal. Immediately after the obstruction the arterial pressure dropped to shock level. Carlson believes that these changes are probably of not much clinical significance because in clinical cases the occlusion usually occurs slowly.

CLARENCE C. REID, M.D.

Herrmann, L. G., and Reid, M. R.: The Conservative Treatment of Arteriochronic Peripheral Vascular Diseases. *J. A. Surg.* 934, 90-130.

Herrmann and Reid analyze seventy-five unselected cases of arteriochronic obliterans in which they used Pavlex therapy (passive vascular exercises consisting of rhythmic alternation of negative and positive pressures about the affected extremity or extremities). They found that four complete cycles (from atmospheric pressure to positive pressure to negative pressure and back again) of alternating pressure from negative pressure of about 80 mm. to a positive pressure of from 30 to 40 mm. of mercury will bring about the greatest increase in the arterial circulation with the least damage to the tissues of the extremity. One complete cycle of fifteen seconds positive pressure is used for five seconds and negative pressure for ten seconds. The frequency and length of the treatments depend entirely upon the urgency of the condition, varying from three to seven hours a week to from four to eight hours a day.

Of the patients whose cases are reviewed, thirty-three (44 per cent) reported that they had been completely relieved of their major symptoms, and thirty (40 per cent) reported that they had been greatly benefited. In the cases of four patients who had definite gangrene of the foot when they were admitted to the hospital the gangrene was limited by the treatment and sufficient collateral arterial circulation developed to permit amputation through the foot with prompt postoperative healing of the wound. Eight (11.67 per cent) lost their extremities because an adequate collateral circulation could not be established by the Pavlex treatment.

The benefits of the treatment are least obvious in patients with extensive obliteration of the arterial bed of the feet and most striking in those in which the pathological changes are limited principally to the major or secondary arterial pathways, especially those with rapid occlusion of the artery by embolism, trauma, surgery or thrombosis.

ELIZABETH M. COE, M.D.

Barnard, W. G., and Barbary, W. M.: Gangrene of the Fingers and Toes in a Case of Polyarteritis Nodosa. *J. Path. & Bacteriol.* 934, 39-45.

The main feature of the case reported, that of a girl eight years old, was the condition of the ex-

tremities, which presented a patchy purplish discoloration. The discoloration was most marked in the fingers and toes, where it was very dark, but occurred also in the elbows, knees, forearms, and legs. Examination revealed also a generalized tenderness in the muscles and a slight effusion in both knee joints. The radial and dorsalis pedis arteries were not palpable. During the course of the disease the discoloration of the extremities extended until all of the fingers and toes were quite black and presented a shrivelled appearance suggestive of dry gangrene. The backs of the hands and feet became purplish and slightly edematous. Before the child died, three months after her admission to the hospital, the color appeared to fade slightly. Death occurred in convulsions. The blood examinations showed an increase in the leucocytes from 50,000 to 86,000 and from 78 to 80 per cent of polymorphonuclears.

Postmortem examination disclosed arterial changes which ranged from necrosis of patches of hypertrophied intima to necrosis of the greater part of the wall of an artery and from slight inflammatory infiltration to an inflammatory lesion of great artery. The radial artery was found filled by a thrombus. Its intima was greatly swollen partly by edema and partly by multiplication of its cells, and its media was edematous and partly necrotic. The pulmonary arteries also showed comparable little pathological change. The authors regard this fact as of significance because the arteries most commonly affected in polyarteritis are the muscular arteries. They suggest that it may give some clue to the cause of the disease. The characteristics of the lesions led them to conclude that the condition may be a virus or an allergic rather than a bacterial disease.

MIRIAM JO. VITTES, M.D.

Vance, B. M.: Thrombosis of the Veins of the Lower Extremity and Pulmonary Embolism as a Complication of Trauma. *Am. J. Surg.* 934, 95-9.

Vance discusses the incidence of thrombosis of the veins of the lower extremities and pulmonary embolism in cases of trauma collected from the Office of the Chief Medical Examiner of New York City.

The injuries were the common injuries sustained in large cities. Seventy-two per cent were due to automobile accidents. The lesions varied in severity from severe fractures of the pelvis or the shaft of the femur to mere contusions and abrasions of the extremities.

The interval which elapsed between the occurrence of the trauma and sudden death from pulmonary embolism varied from four to fifty-four days. The average interval ranged from ten to thirty-four days. This indicates that the influence of the trauma on the production of the thrombosis and the embolism was not similar to every case.

Of almost two cases in which the trauma involved the bones and soft parts of one of the lower extremities, thrombosis was found in the veins of the con-

# SURGERY OF THE BLOOD AND LYMPH SYSTEMS

sponding lower extremity in thirty-two. In fourteen, no thrombus could be found. Of fourteen cases of injury in which some other part of the body besides the lower extremities was involved, thrombosis of the femoral vein was found in nine. These figures suggest that a traumatic lesion near the femoral vein or its tributaries has an influence on the production of thrombosis in that vein. However, a similar thrombosis occurred in the femoral veins in cases of injury not involving the lower extremities, in which the influence of the trauma must have been more remote. Moreover, femoral vein thromboses and fatal pulmonary embolism occurred in non-traumatic cases of all kinds. Therefore the basic cause must be some factor other than physical injury.

Microscopic investigation of the thrombosed veins of the lower extremity, both in the traumatic and the non-traumatic cases, disclosed that in almost all instances a phlebosclerosis, a subacute phlebitis, or a periphlebitis of greater or less degree was present. In many cases these lesions probably antedated the trauma. In others, the effects of the trauma, whether general or local, probably precipitated the inflammation and produced an aseptic thrombosis which eventually resulted in the fatal pulmonary embolism.

It is evident that thrombosis of the veins of the lower extremity followed by pulmonary embolism must be considered by the surgeon as a possible complication of fractures and other traumatic lesions, especially in individuals who have reached middle age. The development of the thrombosis is insidious. The patient seems to be on the road to recovery when, without warning, the pulmonary embolism develops and death occurs suddenly in an attack of acute asphyxia.

Deaths from pulmonary embolism are responsible for many interesting medicolegal tangles, especially in accident cases. There is always a difference of opinion with regard to the part played by the trauma in the development of the complication. Obviously a bruise of the leg is a less serious injury than a fracture of the lower third of the shaft of the femur, but both types of injury may be followed by pulmonary embolism. In the author's opinion the trauma precipitates the process, but the basic cause is a diseased or injured vein in the lower extremity.

JACOB M. MORA, M.D.

## BLOOD, TRANSFUSION

Judin, S. S., and Skundina, G. The Problem of Cadaver-Blood Transfusion (Das Problem der Leichenbluttransfusion) *Wien med Wchnschr*, 1934, 2: 817.

The cases reviewed were treated at the Emergency Institute at Moscow. The conditions consisted chiefly of injuries from street accidents, acute gastro-intestinal hæmorrhages, and abdominal pregnancies. On account of the great number of blood transfusions which were necessary it was difficult, and sometimes impossible, to secure living donors for all cases. The

idea of using cadaver blood was based on the animal experiments carried out by Schamov in 1928. The Emergency Institute proceeded cautiously in this direction. Experiments with regard to the viability of the blood were undertaken first. The transference of oxygen was studied according to the method of Barcroft. It was found that, in animals, this was possible by means of cadaver blood as well as by means of living blood. The authors report an experiment performed on a dog in which an amount of blood equal to 50 per cent of the body weight was withdrawn. Despite injections of sodium chloride solution the animal's condition became progressively worse. After the transfusion of cadaver blood complete recovery resulted and there was an increase in the erythrocytes and hæmoglobin.

Only the blood of persons who had succumbed to street accidents, angina pectoris, and other factors causing sudden death was used. Blood from cadavers with crushed limbs, intestinal wounds, and severe cranial injuries, and from the bodies of persons who had been drowned was not used. Before any cadaver blood was transfused a complete autopsy was done to rule out the presence of chronic diseases such as tuberculosis, syphilis, and tumors. The greatest length of time that was allowed to elapse after death before the blood was withdrawn was six hours. The method of blood withdrawal was important. An incision was made in the internal jugular vein and a glass cannula with rubber tubing was inserted. With the cadaver in the Trendelenburg position the blood flowed freely.

Investigation showed that the blood came only from the superior and inferior venæ cavæ. The average amount obtained was about  $1\frac{1}{4}$  liters. The blood was led into sterile flasks where it was mixed with sodium citrate. It was then kept on ice in dark flasks. Ice retards the proteindecomposition and the exclusion of light preserves the colloids. Hæmolysis began only after thirty days. On the average, the blood was used up to three weeks after it had been bottled, but even when it was older it caused no deleterious reactions.

The blood was tested to make sure that it was free from bacteria. A Wassermann test was made and the serum reactions and blood groups were determined.

To date, the Emergency Institute has performed 350 blood transfusions with cadaver blood. The advantage of this method is that 1,000 c cm of blood or more can be given, which is impossible when a living donor is used. The reactions were in no way different from those with living blood. There were 5 severe complications (2 cases of hæmolysis, 1 of septic phlegmon at the site of venesection, 1 of anaphylactic shock from repeated transfusion, and 1 of air embolism).

The method was used particularly in cases of severe gastro-intestinal hæmorrhage to prepare the patient for operation or to render operation possible in doubtful cases without delay. By means of it,



70 per cent of the patients were saved. Several cases are reported. The method was used also for shock. The mortality from shock in the Emergency Institute was high. By means of cadaver-blood transfusions 50 per cent of 60 patients were saved. However, it was necessary to use very large quantities of blood (from 1,000 to 1,500 c cm) before and after the operation and sometimes during the operation.

It was notable that in some of the patients with gastro-intestinal hemorrhage and some of those with shock the hemoglobin content of the blood had fallen to from 15 to 1 per cent.

Cadaver-blood transfusions were given also in 44 cases of carcinoma with the result that in some of them the patient was rendered operable.

(FRANCE) PIERRE SHAPIRO, M.D.

### LYMPH GLANDS AND LYMPHATIC VESSELS

Teneff, S. Experimental Studies of the Healing of Wounds, New Formation, and Autoplastic Transplants of Lymph Nodes (Recherches expérimentales sur la guérison des plaies, sur la néoformation, et sur les greffes autoplastiques des ganglions lymphatiques) *Lyon chr* 934, 3 54

From experiments on guinea pigs, the author draws the following conclusions:

Wounds of lymph nodes heal by the formation of a connective tissue scar which never disappears and is never replaced by normal lymphatic tissue.

Where all of the lymph nodes have been extirpated new lymph nodes may sometimes appear after a certain length of time. These lymph nodes represent, in general, a hypertrophy of rudimentary lymph nodes present in those regions or, possibly in very exceptional cases, hypertrophy of adipose and lax connective tissue.

Autoplastic transplants of complete lymph nodes with their capsules never "take." Autoplastic transplants of lymph nodes without capsules survive for a certain length of time, but eventually disappear completely.

AARON S. SCHWARTZMAN, M.D.

Desjardins, A. U. The Etiology of Lymphoblastomas. *J Am Med Ass* 934 92 1032.

The exact character of the pathological conditions collectively designated by the term "lymphoblastomas" still eludes the physician. Although these conditions have been the object of extensive study pathologists are still far from agreement regarding the essential and differential characteristics of Hodgkin's disease and lymphosarcoma. Some of them regard these conditions as essentially malignant and as different phases of the same process, while others insist that Hodgkin's disease is an entity quite distinct from lymphosarcoma.

First of all it is essential to consider the immediate cause. On two previous occasions Desjardins has suggested that the factor immediately responsible for lymphoblastomatous hyperplasia of the lymphoid structures is chronic infection. This infection may be tuberculous, pyogenic, or syphilitic. In fact, its

type is of little consequence provided the infectious element is present for a sufficiently long time. The duration of the infection may vary considerably in different patients. If the history of the patient's physical ailments is carefully and persistently inquired into, evidence of infection of long standing will be obtained in the majority of cases. However, if the historical inquiry is to yield the desired information it must be pursued with method.

Of particular significance is Desjardins' observation that the chronic infection has invariably affected a part of the body drained by the group of lymph nodes which first gave indications of lymphoblastomatous hyperplasia. The practically constant association of infection and primary lymphadenopathy in the same region and on the same side of the body can hardly be regarded as coincidental. If this association were the result of chance, the anatomical relationship would not be so consistent.

A definite and unquestionable history of chronic infection in a region drained by the nodes first affected with lymphoblastoma cannot always be obtained. Failure is especially prone to occur in the cases of farmers or laborers who are obliged to work hard and steadily and who pay little attention to what they regard as minor ailments. Patients of limited intelligence and patients in whom the early manifestations of lymphoblastoma have been confined to the abdomen. Unless fairly pronounced, infection of abdominal structures, such as cholecystitis, urethritis, or pyelonephritis, may not attract the patient's attention. Chronic infection therefore appears to the author to be the immediate cause not only of Hodgkin's disease and lymphosarcoma but also of the various forms of leukemia. However, even if this etiological relationship is undeniable, a predisposing factor is required to provide a suitable background for the immediate cause. Such an additional and essential element is probably to be found in hereditary predisposition or tendency of the lymphoid tissue to react in certain way to various noxious influences. Desjardins reports a few cases encountered within a limited period.

In conclusion he says that if chronic infection is the immediate cause of lymphoblastoma, as he assumes, it behooves the physician actively to combat infection wherever it may appear and by every means in his power to prevent such infection from becoming, so to speak, endemic. Patients should not be allowed to harbor indefinitely teeth, tonsils, or gall bladder or other structures that are infected. The importance of this conclusion is all the greater when the ancestors of the patient are known to have suffered from lymphoid disturbances.

Brunschwig, A., and Kandel, E. A Correlation of the Histological Changes and Clinical Symptoms in Irradiated Hodgkin's Disease and Lymphoblastomatous Lymph Nodes. *Radiology* 934, 3 55

In brief presentation of their views of the etiology and genetic relationship of Hodgkin's dis-



# SURGICAL TECHNIQUE

## OPERATIVE SURGERY AND TECHNIQUE; POSTOPERATIVE TREATMENT

Behr, H.: Statistics on Thrombosis Covering a Period of Twenty Years (50 Jahre Thrombosestatistik). *Arch. f. path. Anat.* 934, 20 699

The author reviews statistics on thrombosis covering the twenty year period from 1913 to 1933. These statistics are especially valuable because they were based on Poll's mathematical system of compilation. Of a total of 6,38 autopsies, venous thrombosis was found in 935 and pulmonary embolism in 640. In the period from 1913 to 1919 the total number of thromboses decreased about 10 per cent, and in the period from 1919 to 1933 it increased somewhat. In females the decrease was somewhat greater and the increase was somewhat smaller. The 640 pulmonary emboli were almost equally divided between the sexes. However, it was noteworthy that in the females the maximum incidence of embolism was reached a year before the maximum incidence of thrombosis, whereas in the males the incidence of embolism reached its maximum at the same time as the incidence of thrombosis. The average age of the subjects of thrombosis and embolism considered together was forty-seven and six-tenths years. The average age at which thrombosis occurred was fifty-seven and eight tenths years, and the average age at which embolism occurred, sixty and six-tenths years. Sixty-two and two-tenths per cent of the thromboses occurred in the femoral veins. If the pelvic veins are included with the latter this venous region was involved in about 80 per cent of the cases. Both sides of the body were involved with equal frequency. All of the greater circulation. In only 1 case did an embolus originate in the pulmonary artery and pass into the right auricle through patent foramen ovale. In cases of smaller emboli more often than the left lungs were more frequently involved than the left lobes. Inflammation was found to be the cause of thrombosis and embolism in 3 per cent of the cases. The percentage was increased to 60 per cent by disease of the heart and vessels, and to 80 per cent by infectious degeneration of tumors. Circulatory disturbances without infection caused thrombosis in only 7 per cent of the cases.

(Max Brown) *Pathol. Scand.* 31 D  
Surgical Operation. *Am. J. Surg.* 944 26 5

Robertson, H. E.: Pulmonary Embolism Following Surgical Operation. *Am. J. Surg.* 944 26 5  
Robertson says that the menace of thrombosis and embolism is ever present and the question of its prevention.

vention should be very live one. If, as has been asserted, some hidden infection is the cause, there is little hope of success. This would be true also if the processes were shown to be due to increased coagulability of the blood as any attempt to lower the coagulability of the blood would be likely to prove as dangerous as the condition to be combated. However, if, as seems likely, this is the venous stasis is the underlying cause, there is every reason to attempt prophylactic procedures to increase the activity of the blood flowing in the regions of stagnation since it is quite clear that the more rapid the blood flow the less would be the tendency toward the growth of intravital thrombi.

While in this article the author does not advocate any particular measures to increase the blood flow in the veins of the pelvis and lower limbs, he states that massage, frequent intervals, passive and active motion of the legs, frequent moving and turning of the body and encouragement of an increased respiratory rate, such as deep breathing, are logical procedures. Even more important is the local use of heat. Keeping the feet and legs warm and applying heat locally to the pelvis might prove deciding factors. The administration of vascular stimulants, such as thyroid extract, might be indicated in selected cases, but caution in their general use is necessary. Even in the presence of so-called massage and hypodermic, all of these methods except massage and hypodermic may be used. Of chief importance are recognition of the possibility or probability of the development of this lesion and efforts to find a practical method to prevent it.

Roussel, J.: Acute Postoperative Distention of the Stomach Complicated by Perforation (Dilatation aigue post-opératoire du l'estomac compliquée de perforation). *Presse méd. Par.* 1934, 43 518

The author reports an unusual case in which following removal of the uterus and adnexa for a woman, the patient, forty-one year-old, developed fever with marked distention of the stomach and slight fever. The patient refused appearance of blood in the stools and ninth day severe hematemesis and abdominal pain. It split of repeated transfusions of blood, the bleeding ceased and death occurred on the sixteenth day after the operation.

A autopsy revealed in the anterior wall of the greatly dilated stomach, a hole the size of a coffee piece which was adherent to the under-surface of the liver and blocked with a blood clot. There was no perforation, and no thrombosis of vessels as found. The edges of the hole gave the impression of diffuse gas-

# SURGICAL TECHNIQUE

Few postoperative perforations of the stomach have been reported. The author was able to find only two cases of associated postoperative dilatation and perforation. He believes that, in the case he reports, vasodilatation and acute ulceration occurred as a result of prolonged dilatation, and that simple gastric lavage might have prevented the development of the fatal complication.

MAX M. ZIMMER, M.D.

## ANTISEPTIC SURGERY, TREATMENT OF WOUNDS AND INFECTIONS

Kozdoba, A. Experimental Results With Regard to the Treatment of Infected Wounds (Experimentelle Ergebnisse ueber die Behandlung infizierter Wunden). *Nov. chir. Arch.*, 1934, 30: 181.

Kozdoba reports the findings of 169 experiments carried out on dogs, rabbits, and guinea pigs in which a study was made of the healing of wounds produced artificially, infected with various spore-forming and non spore-forming bacteria by means of street dirt and osteomyelitic pus, and treated with vucin, rivanol, bichloride of mercury, tincture of iodine, brilliant green, pyoctanin, hypertonic sodium chloride solution, magnesium sulphate solutions, and autogenous vaccines.

The effect of the antiseptic agents was twofold, consisting of a direct action on the pathogenic bacteria and stimulation of the defense reaction of the body as a whole. Some of the antiseptic agents used—brilliant green, pyoctanin, rivanol, and bichloride of mercury—not only produced an effect at the site of their application but also penetrated into the deeper tissues, inhibiting the spread of the infection and promoting healing.

In wounds infected with double the lethal dose of certain organisms the most effective antiseptics were rivanol, pyoctanin, brilliant green, tincture of iodine, hypertonic sodium chloride and sodium acetate solutions, and bichloride of mercury. In relation to chronic suppurating wounds the corresponding order was hypertonic sodium chloride solution, brilliant green, pyoctanin, tincture of iodine, and rivanol. The best results were obtained with combined superficial and deep antiseptics and proper mechanical cleansing of the sloughs.

Of the 169 animals, 63 (36 per cent) died. The author states that the prolonged use of antiseptics hinders the formation of granulation tissue. After a number of days weak concentrations of the antiseptic should be substituted for the initial concentration and these should be followed by the use of hypertonic solutions, especially of sodium acetate. Weak solutions of brilliant green and rivanol do not interfere with the formation of granulation tissue. Strong solutions of antiseptics cause necrosis of various tissues, particularly subcutaneous tissue and nerve fibers.

In conclusion the author recommends caution in the application of his experimental findings to man. (G. ALIPOV) JOHN H. GARLOCK, M.D.

Lexer, E. The Treatment of Pyogenic Infection and Its Sequelæ (Die Behandlung der pyogenen Infektion und ihrer Folgen). 58 Tag d. deutsch. Ges. f. Chir., 1934.

By "pyogenic infection" is usually understood not merely wound contamination with pyogenic organisms, but also the consequences developing during the course of the local disturbances after invasion of the tissues.

If one regards as a general disturbance the influence of the local disturbance on the organism as a whole, comprising attack and defense, the destruction and restoration through absorption of the bacteria and their toxins and the constituents of broken down tissue with resulting infectious resorption fever, one finds even in this conception a basis for all that which, for convenience, we still often term simply "sepsis."

There is as yet no uniformity in the treatment of local pyogenic infection. The guiding principle of the basic rules has become largely lost, partly because of overvaluation of the methods of treatment proposed and partly because of underestimation of the processes and their results.

Infection of a wound or mucous membrane surface takes place by rapid absorption of toxins and pathogenic micro organisms into the lymph or the blood stream. Thereby the defensive powers of the organism are aroused and some of the micro organisms are removed. If many micro organisms from a human disease focus enter a body that is lacking in defensive powers, a general bacterial infection may result. The latter may occur even before the development of a local disease picture. However, as a rule invasion follows the infection after a more or less long period of adaptation and maturation. In this fact may be found the reason for the success of operative care of the wound in cases of wound infection—complete excision of the wound according to the principles of Friedrich in cases of superficial wounds and the removal of all injured and dead tissue according to the rules of von Bergmann's school in cases of deep wounds.

The local clinical picture is that of a fight consisting of attack and defense. The fiercer the battle, the greater the destruction and suppurative dissolution of the fighting tissue. The tissue gains the victory when it succeeds in walling off, destroying, and expelling the attackers and their toxins and the poisonous mass of dead tissue. On the other hand, in the case of the toxins of putrid and gas oedema infections, in which the poisoned tissue is hardly capable of putting up a defense, toxic general infection follows very rapidly.

The correct aim of treatment is support of the tissue in its fight against the excitants of the infection. There are four ways of supplying this support, which, used at the right time, supplement one another.

1. Raising the general resistance. This may be definitely effective when local treatment is impos-

sible or insufficient, as in erysipelas or severe suppurations of the mucous membrane. Under such circumstances the best results are obtained with convalescent serum and blood transfusion and somewhat less satisfactory results with specific therapeutic sera, vaccines, and proteins, remedies which, cautiously used, may be effective also in general infection. Resorption fever when it persists or recurs in spite of early correct local treatment, affords an indication of the severity of the infection and of the need of the organism for support. However in cases of acutely progressing inflammation postponement of local aid leads to most serious consequences.

2. Strengthening of the local defense processes by increasing the inflammatory process is an idea by which Bler has created for himself an enduring monument. It cannot be doubted that the action of passive hyperemia consists in a powerful increase in the activity of all the cells of the reticulo-endothelial system which are capable of phagocytosis. Nevertheless, in all of the more severe infectious processes this procedure is a two-edged sword for an increase in the inflammation causes an increase in tissue pressure and therewith spreading of the infectious masses of exudate through increased breaking down by the action of the leucocytic ferments which dissolve proteins. The hope that the use of small incisions would prove sufficient in all cases to prevent necrosis of bones and tendons and destruction of joints has not been fulfilled. In acute suppurations this method of procedure has wholly failed. Moreover, it is associated with the danger of spread of the existing micro-organisms by the blood stream in consequence of increased absorption after removal of the constricting bandage.

Hoffmeister and von Seemen have shown in animal experiments that treatment by passive hyperemia results in an increase in the number of diastosing cells of the reticulo-endothelial system in the synovial membrane of the joints. Similar experiments on young long bones showed a great increase in the number of these cells particularly on the metaphyseal side of the epiphyseal line. That the dilution of the toxin by edema with subsequent resorption may have a considerable effect is known from the clinical course of congested joints infected by the gonococcus.

In its local effect, treatment by passive hyperemia bears relation to treatment with poultices and moist dressings. However the ripening of the abscess, which is their object, takes place at the cost of the tissue and is therefore objectionable. In mastitis it is followed by the casting off of necrotic portions of the mammary gland. If escape for the masses of pus is not provided by early incision and the pus is forced by tissue pressure down into the deeper parts, the parietum, which was at first only subcutaneous, is followed by peristitis of the tendons, joints, and bones. Schmidt and Loehr were able to demonstrate these lymph passages by the injection of India ink and to show in roentgeno-

grams the corresponding points of attack by the infection in the bone and joints.

However when properly used, these procedures also offer advantages. Roentgen irradiation, short wave stimulation of the circulation, and hot baths have a similar action. They too, can cause a beginning inflammatory infiltration to retrogress or hasten the sloughing of necroses and the formation of granulation tissue after correct operative treatment. However, when the infiltration is already in an advanced stage, these measures should never be used without an incision made at the right time and large enough to afford sufficient escape for the pus. After incision, care must be taken that drainage is free. This is important especially to eliminate the danger of resting infection, particularly in bone and joint suppurations.

According to Bler the burning of pericutely inflamed tissue produces local and general increase in the defensive powers in addition to local destruction of the infected tissue. The procedure, which often appears drastic, may indeed set humoral processes into action, but according to the findings of Erb, it is doubtful whether the latter reach the point of increasing resistance to the infection.

3. Operative opening of the focus of infection. This does not have for its aim the destruction of the bacteria responsible for the infection, which is the objective of deep antiseptics. The chemical substances which are able to kill pathogenic bacteria in the test tube and do not injure healthy tissue act in diseased tissue only in solutions so strong as to cause tissue necrosis. Success is best obtained by injecting the patient's own blood around carbuncles and is reached by Larrea's method. However, these incisions have less tendency to progress acutely in the tissues than severe phlegmons.

In operative treatment, incision performed correctly and at the proper time is still the preferred procedure. To be correct, the incision must be made without causing tissue injury which will result in disturbance of function; it must be as large as necessary, and as small as possible, and it must create the best anatomical route for drainage. The proper time for incision is before the tissue has suffered damage. Therefore the rule should be to open up the acutely progressing infiltration before it is demonstrably softened. On the basis of similar considerations early operation is demanded for suppurations in the abdominal cavity.

In making the incision, the surgeon is justified in disregarding future function only when the inflammatory focus has become the source of a general infection. Under such circumstances he should not hesitate to perform even an amputation if that operation should be necessary. Venous ligation can help only if the vein ligated constitutes the main route of spread of the infection from the peripheral regions and the site of the ligation is in a portion of the vessel which is still healthy. Simultaneous early exposure of the perivascular interstices may check the further progress of the infecting bacteria.

If the tissue is not strong enough to destroy and expel the infectious residuum after the focus has been opened up, the operative opening must be followed by further support of the healing processes by all measures which increase the flow of wound secretions, further the separation of necroses, and stimulate the formation of good granulations. Frequent changes of irritative moist or ointment dressings and sugar treatment in combination with warm baths or passive hyperæmia are the most advantageous methods when associated with gentle treatment of the tissues in the changing of the dressings and rest of the part.

These simple basic rules of operative treatment permit wide variation in the details.

The main grounds on which, even today, efforts are being made to change these basic rules are to be found in the belief of many that the tissue can be so strengthened that it will be able to deal with the infection almost alone, in the efforts of many to limit incisions to the smallest possible in all cases, in incorrect treatment of the incision wounds, and, finally, in the difficulty in recognizing clearly whether aggravations are due to virulence of the infection or the method of treatment. The fear that operation may spread the bacteria in the tissues when, with the frequently preferred treatment with compresses, a defensive wall has not been formed, is a common and often serious error. This is true also as regards the treatment of carbuncles of the face and neck. If these lesions do not progress, the simple application of ointment on muslin, which keeps a way open for drainage from the pus cavities, is better than the use of poultices which, by the softening they produce, favor advance of the infiltration. The latter treatment is responsible for death from delay of operation and for extensive carbuncles requiring very extensive interventions.

Increased resorption of infecting bacteria following the incision occurs only when the wound is improperly treated. Antiseptic wound treatment with chemicals is no less dangerous than the wiping out and painting with tincture of iodine of tissue that is infiltrated with pus. The actual cautery produces the same result by creating an eschar which obstructs the escape of the secretion from the inflamed region. Mechanical cleansing of the wound surfaces with every change of dressings very often leads to fever because of resorption of the infecting bacteria. This subsides immediately when the wound treatment consists only in covering the wound with ointment on muslin.

The wound of the incision never of itself lets the infecting bacteria penetrate deeper as the tissue is under positive pressure and the fluid in it passes outward from the fresh wound surfaces. Only if the tissue is treated roughly, does the infection spread in the tissues. Then, if the infection is severe, it may spread even from suppurating granulations. Frequent fever with spreading inflammation instead of a fall of the temperature is the result. In even extensive purulent osteomyelitis with high fever and

large numbers of staphylococci in the blood, careful opening of the bone marrow cavity is followed by a fall in the temperature and disappearance of the bacteria from the blood. It is necessary only to keep the wound open, drain the pus from the deep parts with tubes, and drain the oozing tissue fluid by capillary drainage.

The use of the diathermy knife and the removal of tissue infiltrated with pus by means of the electric loop offer great advantages. The danger of post-operative resorption is entirely eliminated by these means, the passage of fluid from the tissues into the wound is not obstructed by the cooked layer because there is no eschar, and hemorrhage and pain are slight (von Seemen). The wound is dried out by tamponade only when the mistake is made of using a tampon for more than two days at the most instead of replacing it by moist dressings or ointment on muslin.

The most frequent error in the operative treatment of wounds is a poorly made incision—either an incision which is too long and causes functional disturbances or an incision which is not long enough. Other mistakes are mechanical cleansing of the wound by sponging, insufficiently gentle treatment of the tissues (curettage and scraping, painting with tincture of iodine), chemical and thermal injury (derivatives of quinine, ice bag), firm, instead of loose, tamponade inducing retention of the secretion instead of capillary drainage, and the indiscriminate use, in every operation on an inflammatory focus, of Esmarch's bloodless field which favors the detachment of lymph thrombi and venous thrombi.

Infiltration anæsthesia induced in the inflammatory tissue or its close vicinity should be avoided as it forces the infectious exudates of the tissue into the nearby lymph passages. Moreover, there is no necessity for this kind of anæsthesia.

4 The fourth means of treatment consists in placing the diseased portion of the body at rest, in the case of the extremities with elevation if possible. Every tissue which is putting up a fight must be aided by rest and measures to establish good circulatory conditions. A correctly applied bandage is often of itself enough, as is evident from the frequent rapid retrogression of acute lymphangitis and lymphadenitis and of erysipelas following the application of immobilizing bandages.

The first immobilizing bandage should be so applied that when the wound dressing is changed only a part of it need be removed and all unnecessary movement may be avoided. The changing of dressings necessitated by a rise in the temperature or saturation of the dressing must be carried out with extreme care. As a rule it should be done without the use of general anæsthesia in order that the complaint of pain may give warning of tissue irritation.

The immobilizing bandage should not be used too long.

The acute stage is often followed by tedious illness of varying character. Fistulous suppurations, coated wound granulations, and resistant and extensive

edemas are evidences of the difficulty experienced by the gradually exhausted tissue in clearing a way especially large foci of necrosis. The object of treatment must be the complete excision and sloughing of the necrotic areas, not their encapsulation which carries with it the danger of latent infection. This is evident most clearly in suppurative osteomyelitis, in which foci left behind may be roused by trauma years later to the most severe inflammations and may even give rise to endocarditis and myocarditis. It is therefore better to remove necrotic foci after enlarging the fistule than to obtain healing of the fistule with encapsulation of necrotic foci by the injection of chemical substances or by placing mag-gots within them. Softening and separation of the inflamed tissue can be brought about by all kinds of heat treatment, hot kadiol dressings, short wave treatment, or the induction of passive hyperemia. Residual edemas are favorably influenced by sand baths, under water massage, and vascular gym-nastics.

In the course of the last thirty years the tendency has been, on the one hand, to limit the extent of interventions more and more and, on the other hand, to search for means of increasing the general and local resistance of the tissues in the organism. However, the unfavorable as well as the favorable factors of these tendencies must be considered. Chief among the former is the fact that, more frequently than previously, it is the general practitioner who handles these cases in the all important period of the disease and it is he who decides out. The operation is then often inadequate or com-formed late. More and more are these cases coming into the hands of the surgeon in a neglected state. The chief requirement, which must be met despite all new views, is an early and sufficiently extensive surgical treatment can be correctly judged only by an experienced surgeon and only an experienced surgeon should perform the operation. The chief burden of the fight against a pyogenic infection cannot be left to the tissues and the organism with-out resulting severe injury. This is evident partic-ularly in suppurations of the tendon sheaths, bones, and joints.

Whoever thinks that he can recommend some-thing new and better, must say in what manner and according to what basic rules he has previously earned out the local and general treatment of pyo-genic infection. Caution in criticism is all ays t

(LIVER.) FLORENCE ANTON CARPENTIER

#### ANESTHESIA

Waters, R. M. and Schmidt, E. R. Cyclopropane Anesthesia. *J Am Med Ass* 934, 3 975

The authors report the findings of a clinical study of cyclopropane at the Wisconsin General Hospital, including over 1,000 clinical administra-

tions. Cyclopropane is a gaseous homoe of pro-pylene. The technique employed in its adminis-tration is that known as the carbon-dioxide absorption technique. Cyclopropane is capable of producing anaesthesia when it is inhaled in a concentration as low as 4 per cent, but a plane of anaesthesia sufficient for the majority of abdominal operations requires an average concentration of 3.1 per cent.

In the cases studied the induction of cyclopropane anaesthesia appeared to be quite as pleasant as that of nitrous oxide anaesthesia though less rapid. Recovery seemed to be more frequently accompanied by nausea than after the use of nitrous oxide and ethylene. Curiously severe nausea or nausea and vomiting more often followed minor administrations of the gas than its administration for major surgery. Cyclopropane has given satisfaction as a preliminary to the induction of ether anaesthesia.

At the end of the reported year's study the authors find that cyclopropane is replacing ethylene in the Wisconsin General Hospital to the satisfaction of the anaesthetists, surgeons, and patients. They choose it in preference to ether in all over 75 per cent of the cases in which either was used formerly. In cases in which ether is still employed there seems to be an increasing tendency to choose cyclopropane in preference to nitrous oxide as a means of inducing ether anaesthesia.

HILBERT F. TAYLOR, M.D.

Schmidt, E. Therapeutic Dangers and I. Juries Dangers and I. Juries from Local Anaesthetics (Therapeutische Gefahren und Schädigungen durch die Lokal-anästhetika) *Fortchr Ther* 934, 10 406

Local anaesthesia has a number of advantages over general anaesthesia for the practitioner. However it is associated with certain dangers and is capable of causing certain injuries which are not as well known as they should be and must be guarded against by the physician. These dangers and injuries are due to three important causes: (1) poisoning, (2) tissue is-jury and (3) infection.

Poisoning may be caused by the anaesthetic or the adrenalalin or both. In addition to the total quantity injected (maximum dose) the concentration of the solution and the method and rapidity of the injection play a part. Intravenous injection is especially to be avoided. In general it is all ays preferable to use weak solutions and inject them slowly possibly at intervals, and also to add adrenalalin. Among the substitutes for the too toxic cocaine, tropacocaine is preferred for spinal anaesthesia and novocain for surface anaesthesia. Novocain should not be used for le-thargia. It should be used only with special caution. For injection, novocain is best. Tetracain and es-pecially pentocain, possibly with equal parts of novocain, are also satisfactory. However even these substitutes for cocaine are not without danger. Therefore, small doses, dilute solutions, slow injec-tion, the avoidance of intravenous injection and, as the induction of regional anaesthesia the observer

of special care in the region of the spinal foramina are necessary. Like the cocain preparations, adrenalin is non-toxic only if it is given in small doses and in a very dilute solution and is not used for intravenous injection. The value of substitute preparations of synthetic adrenalin or from the posterior lobe of the hypophysis has not yet been proved. Even the combination of cocain preparations and adrenalin may be toxic.

As a rule tissue injuries need not be feared from the ordinary procedures. However, the solution must be administered at body temperature and must be isotonic and sterile. Moreover, a harmless anæsthetic must be chosen and the adrenalin content must not be too high. Adrenalin is dangerous when the tissues are tense or rigid, also in peripheral parts with end-arteries (fingers, toes, and skin flaps), and in infections. Its use is especially dangerous in circulatory disturbances such as those associated with Raynaud's disease, endarteritis obliterans, arterio-sclerosis, and diabetes. In these conditions it is safer not to use local anæsthesia or to use less or no adrenalin. Injury to the blood vessels of the nerves may lead to special disturbances. In the induction of

anæsthesia by the application of cold, care must be taken to avoid injury from the use of too cold agents and too prolonged application of the cold.

Infection may be produced by the apparatus used or the solution injected. Sterilization is done best with steam under pressure at a temperature of 120 degrees. If this method cannot be used, the separate parts of the syringe and the needles should be boiled, and sterilization of the solution in small quantities at a time or by means of a bacterial filter should be done unless prepared solutions in sterile ampoules are used. Infection is favored by contamination by bacteria and by tissue injury. Therefore, progressing phlegmons and sepsis are contra-indications to local anæsthesia.

Fortunately, the injuries and dangers mentioned are not frequent and can usually be avoided by careful observance of the indications and the use of a correct technique. Therefore local anæsthesia in its simplest form remains the most harmless anæsthesia for the practitioner.

In conclusion the author gives the indications and describes the technique for the induction of local anæsthesia. (SONNTAG) LEO A. JURNKE, M.D.



# PHYSICO-CHEMICAL METHODS IN SURGERY

## ROENTGENOLOGY

Forritt, A. E. The Diagnostic and Therapeutic Uses of Thorium Dioxide. *Proc. Roy. Soc. Med., Lond.* 1934, 27: 1921.

After reviewing briefly the discovery by Oka and Radt that thorium dioxide will render the liver and spleen visible roentgenographically, the author describes the technique of its use and field of applicability. No immediate harmful after-effects have been noted, but as the medium is excreted very slowly the length of time that has elapsed has not been sufficient for the determination of a possible remote harmful action. At the present time its use is limited largely to cases of obviously inoperable neoplasms and those in which an exact diagnosis might lead to active treatment that would make a decided difference in the prognosis.

Two cases showing the value of the method are reported in detail. In the first case the case of thorium dioxide demonstrated that a questionable abdominal mass was not connected with the stomach or liver but was probably of the nature of a retroperitoneal sarcoma. Irradiation therapy resulted in almost complete disappearance of the tumor. The author believes that part of the favorable reaction may have been due to the intrinsic radio-active properties of the thorium retained in the adjacent liver. In the second case, doubtful mass was found to be due to marked enlargement of the left lobe of the liver of probably metastatic origin and deep roentgen therapy caused a appreciable decrease in the size of the thorium filled liver.

In conclusion the author says that while it is generally believed that the radio-active properties of thorium are practically negligible, the possibility of beneficial effects from prolonged contact seems to warrant further clinical and experimental research regarding them.

ANDREW HARTWIG, M.D.

Grier, G. W. Radiation Therapy of Cancer of the Skin. *Am. J. Roentgenol.* 1934, 33: 903.

The administration of massive doses of irradiation is now generally accepted as the treatment of choice for cancer of the skin. If roentgen rays are employed, unfiltered irradiation is preferred.

The technique employed by Grier includes the use of 100 k. 5 ma. 10-15 skin-target distance, no filtration, and an exposure time of ten minutes never fewer than 3 such treatments and frequently 4 or more are given. The treatments are administered within one week (intervals of one day). With the advent of methods of measuring roentgen irradiation Grier found that the ten-minute treatment resulted in a dosage somewhat greater than expected. The measurements vary considerably of course. In

different tubes. The ten-minute treatments represent a minimum of 500 r and probably an average between 1,500 and 2,000 r. Four such treatments, which Grier considers the minimum adequate to destroy squamous-cell carcinoma, represent between 5,000 and 8,000 r. The danger of late roentgen reactions is less with this method than when filtered irradiation is given in small doses over a longer period of time. Precancerous lesions are treated by practically the same technique except that frequently fulguration is done before the irradiation treatment is given.

The results in 100 cases treated by the described method in the period between 1926 and 1933 are reported. In 100 cases the irradiation was followed by cure, in 10 by relapse, and in 13 it failed. During the same period 73 cases of precancerous lesions were treated with cure in 67 and failure in 4. Many of the failures and relapses were explained by insufficient irradiation or treatment by fractional or filtered irradiation elsewhere. Others were due to extension of the cancer to cartilage, mucous surfaces, or bone or to metastasis.

EARL E. BARTY, M.D.

Gilbert, A. R., and Jonckheere, E. L.: Ulcerations of the Stomach and Small Intestine Following Roentgen Therapy; Report of a Fatal Case with Perforation. *Radiology* 1934, 23: 140.

The possibility of damaging the gastro-intestinal tract by deep roentgen irradiation has been demonstrated experimentally and by a number of clinical observations. The authors report a case of Hodgekin disease in which deep roentgen irradiation was followed by multiple ulcerations of the stomach and intestines which terminated fatally by perforation. Generalized adenopathy, including marked enlargement of the mesenteric lymph nodes, as present. During the period of nine months from March 8 to December 1929, the patient received total of 5,800 r units of roentgen irradiation given in nine treatments. The treatments usually consisted of irradiation of one anterior and one posterior area of the abdomen. At 20 treatments are more than 500 r given to any one area. On 10 occasions a total of 64 r was given through two portals. The last roentgen treatment was given December 1, 1929, less 380 r units were administered. After that treatment the patient felt weak and complained of loss of appetite and generalized aching which was especially severe across the abdomen. He entered the hospital February 3, 1930. Abdominal symptoms and signs of various types and varying severity eventually led to diagnosis of general peritonitis and an exploratory laparotomy was performed. The patient died on February 9.

The visceral changes found on gross and microscopic examination at autopsy consisted, in brief, of a single huge perforated ulcer and multiple smaller ulcers of the stomach, eight circumscribed annular ulcers of the ileum, and necrosis and hyaline scar-tissue changes in the perirenal and mesenteric lymph nodes. Gross and microscopic examinations of the parabronchial, biliary, mesenteric, and perirenal lymph nodes disclosed tissue structures that resembled lymphogranulomatosis only very slightly. The spleen presented no indubitable changes of that disease.

The autopsy findings seemed to offer little evidence that the ulcerative processes were of the nature of an active lymphogranulomatosis. The changes discovered were comparable to those described by others as gastro intestinal damage due to roentgen irradiation. ADOLPH HARTUNG, M D

### RADIUM

Scott, R. K. Radionecrosis. A Clinical Study. *Med J Australia*, 1934, 2, 1

Radionecrotic ulceration is an ulceration which appears at any time or persists after irradiation. It is characterized by chronicity and the presence of necrotic tissue which shows little tendency to separate. On the basis of the time at which it appears, three types are recognized—the immediate, the subacute, and the delayed.

In the immediate type of radionecrotic ulceration a slough appears immediately after the treatment. In the subacute type, healing becomes arrested after from six to eight weeks of an apparently normal reaction. The delayed type occurs in irradiation scars and has been known to develop as late as ten years after X-ray therapy. It seems to be due to intensive or repeated treatments with inadequately screened X rays. The etiological factor is an insidious, progressive pathological change in the connective tissue.

The most striking clinical feature of radionecrosis is the chronicity of the ulcer. An unexpected histological feature is a general deficiency of polymorphonuclear leucocytes in the periphery of the necrotic field. The thickening of the tissues surrounding the ulcer may cause the clinician to suspect residual malignancy. Indeed, malignancy has frequently been demonstrated in such an area. The peripheral infiltration must be regarded as a tissue response to irradiation. The edges of the ulcer are irregular. The base is composed of necrotic tissue in which the central slough shows stranding. Granulations appear late. The epithelial edge may grow slowly between the fibrinous surface, but more often the fibrin acts as a barrier. Tendons frequently show a tendency to ulcerate and when they become involved by ulceration their loss is inevitable. After sequestration of necrotic fibrous tissue, cartilage, or bone has taken place, healing follows slowly. Pain occurs in the early stages and occasionally is very severe. Involvement of the mandible is especially liable to

cause severe neuralgic pain. In the late stages the pain is less severe. With the onset of healing and separation of sloughs it gradually ceases. Infection is an essential factor in the development of necrosis. Hæmorrhage is not infrequent in the immediate type of necrosis, but is rare in the subacute type. Often observed is a superficial type of ulceration which may be quite extensive and shows a remarkable tendency to separate. Healing is slow. The author has seen the subacute type of necrosis in the lips of syphilitic patients and in breasts. Late necrosis occasionally develops in the neck in an area of scarring and telangiectasis following radium pack treatment.

Beta rays seem to have a destructive action on the tissues which favors necrosis. Radon seeds containing 1.5 mc and filtered by 0.3 mm of platinum frequently give rise to necrosis when they are buried extensively in malignant tissues. Therefore, especially near bone and cartilage, the use of radon seeds has been abandoned. The chief factors responsible for the necrosis seem to be a foreign-body action and prolonged irradiation with a high total dosage of beta and gamma rays. According to the author's experience, the screenage is insufficient and necrosis is favored by beta ray fibrosis. Scott cites cases of late radionecrosis from beta-ray irradiation. He states that the dosage of gamma rays is also very important. The general practice of using 10 mgm of radium per cubic centimeter of tissue for one hundred and sixty-eight hours is erroneous. Such overdosage is apt to produce the subacute type of radionecrosis. The late types more frequently follow beta irradiation, treatment with inadequately filtered X-rays, or repeated X-ray treatments. Especially in the tongue, the immediate type of radionecrotic ulcer is probably a manifestation of gamma-ray overdosage. In the past year the reduction of the dosage of gamma rays has apparently improved the results. The importance of cross-fire from several long needles in parallel planes in the causation of radionecrosis is difficult to estimate clinically. At the present time it is thought that five day doses are less satisfactory than seven-day doses, and that an initial intensity of 20 mc per cubic centimeter is too high. Consequently, the dosage has been reduced to 143 mc-hrs per cubic centimeter in seven days and the initial dosage to 1.5 mc. Further study is necessary to redetermine the clinical limit of connective-tissue tolerance. The goal is the maximum amount of irradiation necessary to destroy the tumor without risk of damage to the host stroma.

The rôle of infection as a primary factor in radionecrosis is well known. Late radionecrosis usually begins as a superficial necrosis which persists. Infection with the bacillus pyocyaneus causes a marked delay in healing. Diffuse fibrosis, which is a common manifestation of tertiary syphilis and the arteritis combined therewith, causes a decrease in the blood supply of a part with resulting local tissue death, namely, immediate radionecrosis. In the syphilitic

tongue, healing is favored by strenuous anti-syphilitic treatment, but the fibrosis rarely disappears. Malignancy in a syphilitic tongue is radiosensitive but prone to recur locally. The recurrence may be of the slow growth and associated with irregular necrotic processes. Further radium treatment is unwise. The most successful treatment is diathermy. The differential diagnosis between a malignant lesion and a gumma is difficult. Absence of response to anti-syphilitic treatment for two weeks is suggestive of malignancy. Malignancy is rarely associated with tuberculous ulcers, but the treatment of tuberculous or gummatous lesions with radium as the result of a clinical or pathological error is frequently followed by necrosis.

With regard to the relationship between the type of malignancy and radionecrosis Scott says that the best results from irradiation are obtained in the hypertrophic type of malignancy. The ulcerating type of tumor with considerable destruction of the subjacent tissues and complicating sepsis, which is invariably present, is a more favorable field for necrosis. In such lesion adequate needle treatment necessitates deeply buried irradiation to reach the advancing edge of the tumor. Therefore, not infrequently, an ulcer remains. When healing is delayed following normal doses of irradiation, vascular degenerations, syphilis, anemia, and toxemia must be considered. Delayed healing is characterized by trophic granulation tissue. In cases of delayed healing necrotic tissue may be present or may develop later.

The infiltrating type of malignancy such as scirrhous carcinoma of the breast, sclerosing ulcer or infiltrating epithelioma of the tongue is particularly liable to undergo necrosis. In cases of such lesions the ulceration is minimal and the patient does not seek advice until late, when the tumor is often quite extensive. The fibrosis decreases the blood supply and stages followed by tissue death and necrosis is likely to result. Radionecrosis is more common in this type of lesion than in any other. In the cases of aged and debilitated patients, treatment with buried needles is frequently not advisable.

Radionecrotic ulcers with cartilage in the base are seen following the burying of needles over the cartilage of the nose and ear but only when the cartilage or its perichondrium has been infiltrated. Needles are buried in such situations without bastation. If the cartilage later becomes exposed or infected, it can be easily removed and its removal will be followed by healing. When bone or cartilage is involved by malignant process, necrosis is inevitable. Secondary infection always occurs. The separation of bone necrosis takes months or years. In the treatment of lesions of the alveolus, buried needles are used with the knowledge that radionecrosis of bone is inevitable. Spicules of bone will be discharged for years if the malignancy is controlled. In most cases, however, there is a foul ulcer with a deep slough, healing is slow and toxemia adds considerably to the general debility. In some cases the

condition clears up, but in the early stages the pain is severe. The therapist is more worried by the cases developing a subacute necrosis which exposes portion of bone and may persist for months or years. This condition is probably the result of local gamma ray irradiation. On the dorsum of the hand the risks attending irradiation are particularly great because the blood supply is poor. Any ulcer developing here is especially apt to be followed by the exposure and sloughing of tendons. A chronically infected ulcer remains complicated by the necrotic tendons, ligaments, and bone. Healing is impossible. Plastic operations are rarely successful. As a rule amputation is necessary and in many cases must be considered the primary treatment of choice.

The treatment of malignant recurrences following surgical excision of the primary growth requires special care on account of the increased malignancy of the recurrence, the limitation of the blood and lymphatic connections, and the consequent increased risk of radionecrosis. In cases of buccal neoplasms in which the removal of infected teeth is necessary radionecrosis not infrequently follows normal doses of irradiation. Careless removal of teeth with severe laceration of the gums or breaking of the tooth roots is one of the causes of necrosis of the alveolus and superjacent tissue following normal irradiation of the tissues.

Another problem is the treatment of malignancy developing on a previously irradiated area. In cases of epithelioma developing on an area of basal erythematous previously treated by roentgen irradiation healing is often greatly delayed. Recurrent lesions previously treated with radium are more resistant to second or third treatment, especially if beta rays were employed or inadequately screened gamma-ray therapy was used initially. The subsequent treatments may be followed by incomplete eradication of the growth, breaking down of the treated area, and a necrotic ulcer. Frequently it is best not to treat such recurrences. However, a simple ulcer even if it is chronically infected by basal squamous or necrotic tissue, is less dangerous than malignant ulcer with sepsis, hemorrhage, and uncontrollable advance of the lesion. As the infection of radionecrotic ulcers lowers the patient's resistance, bronchopneumonia is a not uncommon complication.

The treatment of radionecrotic ulceration presents numerous problems. Infection and toxemia must be combated. In late cases radical treatment is undoubtedly the treatment of choice. Excision must be complete with removal of the fibrotic basal area of the ulceration. Diathermy with a cold knife may be used according to the indications. If the ulcerated area is completely excised, healing usually takes place readily. Occasionally the ulcers appear in locations such as the dorsum of the hand, where excision is impossible. In the mouth, excision followed by suture has given good results. In superficial areas in which healing is delayed following irradiation,

## PHYSICOCHEMICAL METHODS IN SURGERY

skin grafting by the method of Wangenstein has been successful and has many advantages over the method of Thiersch. Conservative treatment consists in efforts to combat sepsis, to restore the circulation of blood, to assist separation of the slough, and to prevent deformity. Pain must be controlled and the most useful dressings are a 1:200 or 1:400 solution of Monsol, a 1:2,000 solution of flavine, hypertonic saline solution, and pure glycerin. Heat and hypertonic solutions are of value. The application of a plasticine dressing is helpful. Borocaine and percarine ointments relieve the pain. Pieces of slough may be removed with the scissors. The application of equal parts of unguentum hydrargyri ammoniaci diluti and unguentum zinci oxidi has proved beneficial. In immediate and subacute types possible treatment. Mouth washes of eusol, hydrogen peroxide, or potassium permanganate are helpful. The food must be soft. The pain in buccal ulcers, which is very distressing, is of two types—a dull continuous pain and a sharp intermittent neuralgic pain. Morphine may be necessary. Injection of the mandibular division of the nerve with pure alcohol at the foramen ovale may be indicated. Sprays of a 1:2,000 solution of percarine in glycerin may be helpful.

Radionecrotic ulcer may cause complete disability. Treatment for pain and cleansing measures to permit healing are necessary. In late necrosis, complete resection of the damaged tissues should be done. The procedure of choice for repair is an immediate plastic operation. Conservative treatment means months of disability. In three cases reviewed by the author deep radionecrotic ulceration of the subacute type occurred in the neck following the application of a radium pack and severe toxæmia and death due primarily to the necrosis resulted.

The author urges rejection of the term "radium burn." In conclusion he states that, because of the nature of the cases coming for treatment, the occurrence of radionecrosis cannot always be avoided in any large radiotherapeutic clinic.

A. JAMES LARKIN, M.D.

Wright, R. D. Pathological Manifestations in Radionecrosis. *Med J Australia*, 1934, 2:8

Radionecrosis is defined as massive continuous death of tissues for which radium or the roentgen rays are directly responsible. By the term "massive death" the author means that the tissues die as a whole. He states that there is no "differential death" such, for example, as death of the vascular tissue without death of the fibrous tissue or death of malignant tissue without death of the stroma.

The aim of short-wave therapy is to kill neoplastic tissue without causing serious injury to normal tissue. The ideal result is a cytotoxic rather than a histotoxic action. Under certain circumstances irradiation will produce an ulceration, and under no circumstances is a therapeutic dose without effect on the reparative tissues. The dose may cause rapid

degeneration of the normal cells and of the abnormal tissues. The desired result is degeneration of the abnormal tissue with subsequent repair, but the neoplasm and the stroma, and possibly the surrounding tissues, may die progressively. This type of necrosis is called "acute" or "immediate." In other cases the reaction to the irradiation occurs normally and the appearance of the ulcer formed suggests that normal repair will take place, but ultimately the entire process becomes stationary. This type of necrosis is termed "subacute" or "delayed." A more unusual occurrence is the breaking down of a previously healed lesion. This type of necrosis is described as "late" or "remote."

The pathological findings in cases of acute necrosis are typical of tissue degeneration elsewhere, with loss of cell and nuclear structure. The author describes the histological picture in detail. He states that there is no satisfactory evidence that an increased rate of mitosis in tumors has a fundamental effect in increasing the sensitivity derived by the neoplasm from its parent cell. The less differentiated the cell, the longer its mitosis, and the more frequent its mitosis, the greater its radiosensitivity. Cells may differ in sensitivity even when the factors of mitosis are constant.

There is no known way of decreasing the sensitivity of vascular and connective tissue. Factors which increase it are favorable to necrosis. Previous irradiation greatly reduces the dose necessary to cause a breakdown. When the stroma is scanty the breakdown will be massive. Underlying syphilitic lesions with endarteritis, collections of radiosensitive small round cells, granulation tissue, and sometimes gummatous necrosis greatly augment the massiveness of the breakdown process. Arteriole sclerosis increases the tendency of stroma to break down. Latent uræmia and diabetes are apparently other factors in the occurrence of breakdown. Breakdown is dependent also on the general health of the stroma and of the patient. Local conditions are of great importance. Tissues subjected to irradiation have a reduced reaction to infection. The anatomical arrangement of the part irradiated, such as the proximity of bones, tendons, cartilage, and fascia, is important.

In the presence of sepsis, slow repair may take place, but when sepsis is present, casting off occurs. Following observations made on tissues subjected to excessive dosage, the author made similar observations after the use of therapeutic doses to determine whether the latter caused similar changes. In experiments on dogs, radon needles 2 cm long which contained 20 mc per centimeter of length and were screened with from 0.5 to 0.8 mm of platinum were implanted under the skin of the forelimbs and the skin of the ears and left in place for six days. The ears were examined three weeks later and the forelimbs eight weeks later. The cartilage showed destruction of the perichondrium with degeneration of some of the chondrocytes and a beginning granulation-tissue invasion of the cartilage.

The bones showed subperiosteal rarefaction with granulation-tissue formation. These changes were definite evidences of superficial destruction of the bone and cartilage. Repair was taking place. According to Obermayer's findings, a flake-like sequestrum would have resulted if infection had occurred.

Muscle tissue close to bone which has been irradiated frequently shows necrosis. According to Mottram, this is due to the secondary irradiation from the bone. In the treatment of tumors of the mouth by irradiation, necrosis of muscle near bone and necrosis of irradiated bone occur frequently if infection develops.

In subacute necrosis the underlying factor is failure of repair. Subacute necrosis is a common consequence of acute necrosis and frequently occurs in cases in which the reaction to irradiation is normal and healing is expected. One of the chief causes of recurrence is syphilis. The author describes the pathological changes in detail with photomicrographs. He states that the question of the adequacy of the blood supply also arises even though ligation of the external carotid artery of the affected side has in some cases been followed by prompt healing. Ultimate healing occurs only when the new formation of hyaline tissue ceases and the remnants of this tissue are removed. This tissue is replaced by

a poorly formed granulation tissue, and healing takes place over this foundation.

Late necrosis occurs in scars resulting from intensive X-ray or radium irradiation. In a non-ulcerated area of specimens of such necrosis the author found slight thinning of the area with almost complete loss of papillation, sweat and sebaceous glands, and hairs. The fibrous corium showed an irregular overgrowth of fibrous and elastic tissue. There was evidence of the formation of fibrous tissue. Telangiectasis was well developed. While other investigators have reported progressive endarteritis obliterans, Wright was unable to find any evidence of this change in two cases of late necrosis. The skin temperature in the scarred area is less stable than that in normal tissue, but no lower. Wright concludes that the total blood flow in the scar produced by radium well screened with 0.5 mm. of platinum and in the thick scar produced by lightly screened X-ray is no less than that in normal skin, and that therefore the cause of the ulceration is not a decrease in the blood supply. His findings show that the epithelium is thin and devoid of appendages. There appears to be a premature aging of the cell constituents. The ultimate death of the latter appears to be analogous to the changes observed by Spear in *Urocyon* cultures.

A. JAMES LARSEN, M.D.

## MISCELLANEOUS

### CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Cutting, R. A. The Absorption of Dextrose and Water by the Small Intestine and the Colon. An Experimental Study. *Arch Surg*, 1934, 29, 643

Cutting says that in view of the relative facility with which the colon absorbs water and, according to his experimental findings, dextrose as well, the prejudice of many surgeons against proctoclysis is difficult to understand.

In the human adult there are at least 2,110 sq cm of mucosal surface in the colon, and if the human colon absorbs at the same rate as the colon of the dog, it is capable of absorbing about 240 c.cm of water and 30 gm of dextrose per hour from a proctoclysis of 5 per cent dextrose solution.

Failure in the use of proctoclysis is due to too rapid administration, which favors expulsion or leakage, or the use of hypertonic solutions, which tend to withdraw fluid from the tissues and are inimical to the absorption of water or dextrose.

Experimental findings in regard to the absorption of dextrose by the colon have yielded markedly different results and are far from conclusive. The problem is far more difficult than it appears to be at first. The blood-sugar level does not rise proportionately with the intestinal absorption of dextrose. In 75 per cent of cases the anæsthetic agent and surgical manipulation cause a rise in the general blood sugar level. Conclusions based on variations of the respiratory quotient as an index of intestinal absorption of dextrose are valueless. The introduction of measured amounts of solution into the intact intestinal canal through the rectum and their recovery by the same route can never be accurate.

The author's experiments, in which trauma was reduced to the minimum, the periods of observation were long, and accurately measured areas of intestinal mucosa were compared, demonstrated that the colon absorbs dextrose as actively as the ileum and absorbs water in far larger amounts than the ileum.

GEORGE A. COLLETT, M.D.

Phemister, D. B., and Livingstone, H. Primary Shock. *Ann Surg*, 1934, 100, 714

Psychic effects on the medullary centers caused by pain or fear from injury or operation may result in a fall in the blood pressure, bradycardia, pallor, and faintness which constitute elements in the syndrome of shock. Abdominal operations, especially those on the stomach and biliary tract, may cause a fall in the blood pressure to shock levels and bradycardia, probably as the result of stimulation of the autonomic fibers of the vagus nerve.

As a rule, these primary psychogenic and neurogenic depressor reactions are transient and of minor importance, but occasionally they may be severe. They may be designated as primary shock. If other factors lowering the blood pressure, such as hemorrhage, are superimposed, a marked state of secondary shock may develop.

Injury and stimulation of somatic nerve trunks in accidental wounds and operations usually do not cause a fall in the blood pressure or any other shock phenomena if hæmostasis and anæsthesia are adequate. However, there are cases in which a fall in the blood pressure occurs early without a known cause and under such circumstances it is difficult to rule out a nervous factor.

The fall in the blood pressure occurring immediately after the release of a tourniquet is due largely to the entrance of blood into the extremity which then becomes the site of a reactive hyperæmia. However, it is impossible to rule out completely the operation of nerve impulses or toxic substances. Primary and secondary shock should be recognized on the basis of a difference in causation rather than a difference in the time of their occurrence.

GEORGE A. COLLETT, M.D.

Brooks, B., and Blalock, A. Shock, with Particular Reference to That Due to Hemorrhage and Trauma to Muscles. *Ann Surg*, 1934, 100, 728

The authors consider two of the various methods by which experimental shock may be produced. These are about as free from complicating factors as any that can be used. The first is traumatization of the soft tissues of an extremity, and the second the removal of blood from a large vessel to reduce the quantity of circulating blood.

Employing the method of traumatization of an extremity under general anæsthesia, experimenters have shown that the production of the shock was associated with the loss of approximately one-half of the total blood volume into the injured part. This loss is sufficient to cause low blood pressure and death. There occurred also an increase in the concentration of the red blood cells, a negative response to the transfusion of blood, and capillary congestion and hemorrhage in many of the organs of the body.

Since the results of experiments indicated so clearly that the cause of death was the loss of plasma and red blood cells into the injured extremity, the authors believed it reasonable to conclude that similar alterations might be produced by the removal of blood from the body—by hemorrhage to the outside. They therefore carried out experiments in which the blood pressure was gradually reduced by the slow withdrawal of blood from the femoral artery under local anæsthesia and the blood

pressure was kept at a low level for as long as possible prior to death. The records in these experiments were quite similar to those obtained when an extremity was traumatized.

In an attempt to classify acute circulatory failure from a physiological viewpoint the authors distinguish the following four types:

1. The hemostatic, i.e. shock characterized by a decrease in the blood volume, vasoconstriction, a decrease in the output of the heart, and subsequently decline in the blood pressure. The simplest example is shock from uncomplicated hemorrhage. Of the same type is shock following trauma to large masses of muscle.

2. The neurogenic, i.e. shock in which there is a vasodilatation dependent on a decrease of constrictor tone brought about by influences acting through the nervous system. Collapse, or primary shock, is of this type.

3. The vasogenic, i.e. the condition in which the vascular dilatation is brought about by agencies acting directly on the blood vessels. Histamine probably exerts the major portion of its effect in this manner.

4. The cardiogenic, i.e. the condition in which acute circulatory failure occurs as a result of a primary disturbance of the heart. This is characterized by venous distention, by contradistention to the collapsed condition of the veins found in peripheral circulatory failure. This type of alteration is produced by a rapid accumulation of fluid in the pericardial cavity.

SARUZI KANE, M.D.

Hauer, G. J. and Andrus, W. DeW.: The Effect of Adrenal Cortical Extract in Controlling Shock Following the Injection of Aqueous Extracts of Closed Intestinal Loops. *J. Surg.* 554, 55, 734.

In experiments carried out on dogs the authors found that the intravenous injection of aqueous extracts of high intestinal loops with fatal obstruction produced a marked primary fall in the blood pressure followed by a secondary rise of varying degree which in turn was followed by a more gradual fall to a definite shock level.

The primary fall in the blood pressure seemed to be due to marked vasodilatation, while the second fall was associated with the loss of plasma-like fluid from the circulating blood.

Simultaneous injection of adrenal cortical extract into the contralateral femoral vein had a markedly beneficial effect in lessening both the degree of the drop in the blood pressure and the amount of plasma loss, and in prolonging the life of the animal after the injection of an aqueous extract of obstructed loop. This protective action was destroyed by boiling the cortical extract for one minute.

When, an hour or so after the injection of aqueous extract of obstructed loops, an animal was in a state of profound shock with a low blood pressure and decreased plasma volume, the intravenous injection of normal saline solution, gum-acacia Ringer's solu-

tion, a 5 per cent glucose solution, or blood failed to restore the blood pressure materially or to prevent further and serious lowering of the plasma volume followed by death.

Extract of adrenal cortex alone was definitely less effective in reviving an animal in this condition, but the administration of this extract simultaneously with transfusion had a markedly beneficial effect, eventually raising the blood pressure to nearly the normal level and maintaining it, restoring the plasma volume, and preventing subsequent loss of the solid elements of the blood, thereby prolonging life.

SARUZI KANE, M.D.

Allen, E. V. Lymphedema of the Extremities: Classification, Etiology, and Differential Diagnosis. A Study of 300 Cases. *Arch. Int. Med.* 1934, 53, 266.

It is apparent that relatively little is known about lymphedema. In a study such as that reported in this article much depends on the accuracy and details of the clinical history and examination of the patients. Invariably when the study of patients with a specific condition has been carried out by diagnosticians with diverse interests, too much emphasis has been placed on the diagnosis and too little on the details of the history and the manifestations of the illness. In the author's study this difficulty was offset somewhat by the fact that in recent years the study of lymphedema at the Mayo Clinic has been centralized. It is only by concentrated inquiry that minute details of development can be traced consecutively, and it is only when this is done that facts about the evolution of lymphedema can be arranged in an orderly pattern.

The experimental data on lymphedema are confusing, somewhat contradictory and at best inadequate and almost inconsequential with respect to their worth in the interpretation of clinical phenomena. No condition simulating chronic lymphedema in man has been produced in animals, and the experimental procedures so far executed appear insufficient when compared with those used in the production of venous edema. Mechanical methods for interrupting the flow of lymph to the root of the leg should be, *pari passu* as devoid of results as those for mechanically interrupting the flow of venous blood. As multiple ligatures of veins in the same area do not produce venous edema, it is not surprising that resection of the pelvic and inguinal lymph vessels does not produce lymphedema. Experiments producing lymphatic thrombosis similar to those producing venous thrombosis with venous edema are necessary. Relatively little is known about the collateral circulation of lymph to the function of the extremity and the body. Although all lymph vessels join the groin and axilla and pass along the large blood vessels, it is important to know about the connection of lymph vessels below these regions with the lymph vessels of the abdominal and thoracic walls and the back. As collateral circulation of the venous blood may be carried on by col-

## MISCELLANEOUS

lateral channels from the root of the limb to the trunk, it is probable that the conditions as regards the lymph vessels are analogous, especially as there is an analogy between the veins and lymph vessels in every other important regard.

Even the clinical diagnosis of lymphœdema is sometimes uncertain, a fact best evidenced by the equivocal parts played by lymphatic and venous obstruction in phlegmasia alba dolens. This uncertainty is due to the lack of conclusive tests for lymphatic obstruction. Solution of the problem of distinguishing lymphœdema from other types of œdema may be found in analysis of the fluid in the cedematous areas, tests of the speed of circulation of the lymph in the extremities, or some method of visualizing the lymph vessels with dyes or by roentgen studies. The author believes that the experimental production of chronic lymphœdema would be an important step in the solution.

In conclusion Allen says that relatively little is known about the bacteriological and pathological changes in the lymphœdematous extremities, and that the etiology and the mechanism of production of lymphœdema cannot be fully considered without the information gained from a careful study of the pathological changes and the bacteria involved.

Meillère, J., and Ollivier, H. R. **Surgical Treatment of Arterial Hypertension** (*Traitement chirurgical des hypertension artérielles*) *J de chir*, 1934, 44 342

During the last twenty years considerable evidence has been accumulated with regard to the rôle of the endocrine glands and the nervous system in arterial hypertension. Recently, section of the splanchnic nerves or suprarenalctomy has been done in quite a number of cases. Arterial hypertension is not a morbid entity but a syndrome.

Essential hypertension is of two types permanent and paroxysmal. In progressive permanent hypertension there is at first a long period during which little besides the elevation of the blood pressure is to be found. This is followed by a period during which signs of functional impairment appear in various organs such as the kidneys, heart, and lungs. Paroxysmal hypertension may come on at varying intervals. It is characterized by signs of localized or generalized vasoconstriction such as headache, epigastric pain, dyspnoea, and anginal pain, and is often accompanied by fever. The paroxysmal type may gradually evolve into the permanent type.

Hypertension may occur during puberty, the menopause, or pregnancy, after hysterectomy, and in cases of tumor of the suprarenal cortex, hyperthyroidism, obesity, diabetes, lead poisoning, syphilitic aortitis, and a variety of other conditions affecting the nervous system, vascular system, or kidneys. The authors give a brief résumé of ten cases reported in the literature which were treated by section of the splanchnic nerves and thirty-six cases in which suprarenalctomy was performed. They divide the latter as follows

1 Five cases of suprarenalctomy for paroxysmal hypertension with ablation of chromaffin tumors of the suprarenal medulla or analogous tumors in that region

2 Five cases of suprarenalctomy for permanent hypertension with a suprarenal tumor. In three of these cases there was a diffuse adenoma or tumor of the suprarenal cortex and in two a tumor of the suprarenal cortex with a suprarenal-genital syndrome.

3 Twenty cases of suprarenalctomy for extreme hypertension in which the suprarenals were normal or only slightly hyperplastic. In eighteen of these cases there was a permanent hypertension and two a paroxysmal hypertension.

After a review of the results obtained in these cases the authors conclude that suprarenalctomy is the procedure of choice. They advocate partial bilateral suprarenalctomy rather than operation on only one side.

MARSH W. POOLE, M.D.

Brocher, J. E. W. **The States of Inhibition of the Bone Marrow** (*Les états d'inhibition de la moelle osseuse*) *Ann d'anal path*, 1934, 11 585

The author discusses in detail the neutropenic states and the conditions which may give rise to them. He calls attention to the fact that formerly neutropæmia was usually reported to follow either a blood disease or an infection. More recently agranulocytosis has been found to follow the use of the X-rays, radio-active substances, benzol and its derivatives, and certain heavy metals. In a group of cases reported there were marked decreases in the leucocyte count after the use of various toxic agents.

Agranulocytosis and aleukæmic leukæmia in the end-stages of inhibition are considered to be the results of an insufficient reaction of the bone marrow with a consequent diminution in the defensive forces of the hæmatopoietic system to infection. Brocher regards agranulocytosis as the expression of a deviated or unfinished phase of a normal biological phenomenon.

HOWARD L. ALT, M.D.

Patrassi, G. **Changes in the Cell Picture in the Bone Marrow in Infectious Diseases and the Origin of the Toxic Granulations in the Neutrophile Cells in the Circulation** (*Modificazioni del quadro citologico midollare nelle malattie infettive e genesi delle granulazioni tossiche dei neutrofili circolanti*) *Sperimentale*, 1934, 88 354.

The object of the investigation reported was to determine whether the toxic granules of the neutrophile cells in infectious diseases originate in the bone marrow or in the peripheral blood. A study was made of the bone marrow of sixty-two individuals who had died of infectious diseases. In the cases of eleven of these individuals toxic granulations had been discovered in smears of the blood during life. To serve as a control, a similar study was made in fourteen cases of non-infectious diseases. The smears of the bone marrow were stained with the stains that are specific for the granulations studied—the methods of Mommson, Hirschfeld, and Freifeld.



Immature cells of the gran leucocyte series pre dominated over the other types of cells, with many myelocytes and a smaller number of myeloblasts. There was a marked abundance of immature astrophile granules in the myelocytes and even in the metamyelocytes and the neutrophils with red nuclei, which indicates rapid and incomplete maturation of the protoplasm. On the other hand, segmented neutrophils were rare and true toxic granules were still rarer and contained only in some of the latter cells.

The author therefore concludes that the toxic granules do not originate in the bone marrow and that possibly in the examinations of bone marrow made heretofore immature astrophile granules were confused with true toxic granules. He regards it as probable that there is myelogenous factors in the production of these granulations to the extent that immature cells enter the circulation during the course of infectious diseases. He states that this is indicated by the shifting to the left in the leucocyte picture and the astrophilia of the neutrophils both in the bone marrow and in the circulating blood. The neutrophile granules of these cells are functionally weaker than those of mature cells. Under the action of the toxins their reactive capacity becomes exhausted and they undergo a retrogressive character led by intense basophilia and finally become true toxic granules. A. DEY GOSS MORRIS, M.D.

Jarro, H. A., and Cummings, R. E. Pycloperistalsis Characteristically Altered by Infection, with Notes on the Functional Behavior of Other Hollow Viscera. *Radiology* 1934, 3: 399.

The authors state that roentgenological record of g and evaluation of function generally do not receive the attention they deserve. Particularly in connection with the urinary passages, very little study has been devoted to them. Excretion pyelography presents new opportunities for roentgen study with avoidance of some of the fallacies associated with the retrograde method in which necessary trans mial and aphysiological procedures frequently led to faulty conclusions.

As a preliminary to the report of their investigations the authors discuss at some length our present knowledge regarding the muscle tissue in the urinary transportation tracts and call attention to previous investigations made mainly by fluoroscopic studies of injected fluids by the retrograde process. In their own investigations they employed the serial roent genographic method and chiefly excretion pyelography through various media. They include in their article several pyelograms made by the retrograde method to show the differences between such pyelograms and those of excretion pyelography.

The technique used in obtaining the roentgenograms is described in detail. Series of normal and pathological pyelograms are presented to show regular and abnormal peristaltic cycles traversing the various renal segments. The motor phenomena are regarded by the author as analogous to the gra

dients of peristalsis conceived of by Alvarez in connection with rhythmicity, irritability, latent period, tone, muscular strength, and metabolic rate for the gastro-intestinal tract.

The authors' findings are summarized as follows:  
1. A rhythmic, progressive, descending peristalsis of the normal renal pelvis is demonstrated by fast serial pyelography.

2. This is different from the alternating type of renal peristalsis described by Lepore, Fey and Truchot, which is considered to be the result of urological or pathological conditions, but seems to occur regularly with any instrumental or infectious disturbance in the urinary tract.

3. Pyelonephritis produces a characteristic alteration of pycloperistalsis ranging from alternating peristalsis through inhibition to complete organic immobilization, depending on the type, virulence, duration, and location of the infection and the reaction between the infecting agent and the host.

4. The characteristic functional effect of low penicilluria is shown by peristaltic and antiperistaltic in the upper ureteral segments.

Analogies and characteristic differences in the functional behavior of various hollow viscera are briefly reviewed and reference is made to previous publications along this line, especially with regard to bronchial peristalsis in health and certain disease conditions. ANDREW HARRISON, M.D.

Bennett, T. Li Gee. Disease Lizard, 934, 7: 739.

Gecko disease, which was described by Gee as a cardiac affection, has been designated also as "non-tropical sprue" and idiopathic steatorrhea. Bennett reports the case of a girl dying at sixteen years of age who had had the condition all her life. He then discusses the main features of the disease on the basis of this case and cases previously reported.

Steatorrhea is characteristic. Analysis of the feces in seven cases showed that more than half of the dried feces is fat. As most of the fat is split, it is apparent that pancreatic function is adequate. Anemia is usually present. It may be hypochromic, but typically is hyperchromic megalocytic. Tetany may be latent or manifest. The blood calcium is often low, the fact distinguishing the bony deformities of steatorrhea from those of hyperparathyroidism. In many cases the blood-sugar values do not rise on application of the usual glucose tolerance test.

In the treatment the diet should be as free from fat as possible. Large doses of iron and calcium have a good effect. Liver extract is of value for the megalocytic type of anemia. In cases with excessive gas formation from the dietary starch tanninase is beneficial.

PAUL ST. EE, M.D.

Roberts, S. R., and Kracke, R. R. Further Studies on Granuloporenia, with Report of Twelve Cases. *Ann. Int. Med.* 1934, 8: 79.

Twelve cases of acute, complete granuloporenia are reported. Attention is called to the fact that six of the patients were lean, pale, anemic women with

## MISCELLANEOUS

little reserve Of the eleven patients who died, two died in a second attack and one in a third attack. Only three of those who died developed a leucocytosis after the granulopenic attack. Treatment by irradiation, transfusion, and the administration of liver extract, pentose nucleotide, and foreign protein was disappointing. Adenin sulphate was not used as the authors see no reason why it should be of aid. The objectives of treatment are the maintenance of life and strength by general measures and stimulation of the bone marrow. The latter is apparently impossible by any known drug or specific measure. After necrosis and sepsis in two of the reported cases the authors observed a rise in the granulocytes from none to 25,000 and 40,000 respectively in four days. They believe that sepsis and necrosis are the chief desiderata in every case of complete granulopœnia, and that it is well to avoid surgical treatment of the necrotic areas. For cases with no evidence of living and necrosis they suggest the injection of living staphylococci into the skin or the intramuscular administration of from 5- to 10-minim doses of turpentine. Their patient who survived was treated with injections of turpentine.

The authors use the terms "complete granulopœnia" and "incomplete granulopœnia" to distinguish the rare disease from the frequent disease. The evolution of the condition is divided into five stages, viz., selective bone-marrow failure, a gradual decrease in the granulocytes in the blood to complete or near complete absence of these cells, the development of clinical symptoms, sepsis, and, finally, an increase in the number of granulocytes or death. The granulopœnias have been classified into ten types, of which acute, complete granulopœnia is one. A low granulocyte count is not proof of itself that the disease is granulopœnia since a low count (leucopœnia) is characteristic of certain infections and may occur in association with others. One out of every four patients may be expected to have a mild granulopœnia. According to the literature, agranulocytosis is of world wide distribution. However, most cases have, of course, been reported from centers in which the blood count is a routine procedure. The disease may occur at any age, but is most common in middle life. Its cause is unknown. It is rare to see a case without a hæmorrhagic tendency. The manifestations of the latter vary from hæmorrhages seen only at autopsy to a condition simulating purpura. The acute, incomplete granulopœnia is commonly far milder than the complete form. As long as granulocytes remain in the blood there is probably some myelocytic activity. Good nursing, food, and water, fresh air, and a watchful, expectant attitude may be all that is advisable. The tendency in the care of patients with incomplete granulopœnia is to do too much.

WALTER H. NADLER, M D

Becker, S W. Melanotic Neoplasms of the Skin  
*Am J Cancer*, 1934, 22 17

Modern pigment study carried out mainly by means of the silver and "dopa" reactions shows that

at the junction of the epidermis and dermis there are specialized cells which are capable of forming pigment. The first sign of pigment activity in the embryo is the positive dopa reaction in a branched cell in that location. This is followed by the appearance of melanin granules in the branched cells and later in the palisade basal cells. The pigment-forming cells are called "melanoblasts" in contradistinction to phagocytic dermal cells which are called "chromatophores." An increase in the number of melanoblasts at the epidermodermal junction results in a smooth brown nævus. In elevated nævi the dermis shows masses of palisading cells which are similar in staining properties and pigment content to the epidermal melanoblasts and are thought to be derived from the same source. The source of melanoblasts is not definitely known, but more and more workers are accepting the theory that these cells are of nervous origin. If melanoblasts are located deeply in the dermis a blue nævus or Mongolian spot results. The distribution here is essentially the same as that in the blue skin of the ape.

Pigment activity due to irradiation by ultraviolet or alpha rays consists of prominence and branching of melanoblasts followed by hyperpigmentation of palisade basal cells. Pigment activity occurring spontaneously with no demonstrable cause results in the same histological picture. The resulting lesion, known as "lentigo," has no relationship to the common freckle known as "ephelid." If this stimulation of pigment activity increases to the point at which melanoblastic proliferation occurs, the lesion is known as "lentigo maligna" and is already a malignant melanoma. Further activity results in a melanoma of either the fusiform cell type—the so-called melanocarcinoma—or the ovoid-cell type—the melanocarcinoma. The occurrence of both types of cell in the same primary or metastatic growth demonstrates the futility of trying to classify melanomata as "sarcomata" or "carcinomata." The best designation is "malignant melanoma." The melanoma arising from a pigmented nævus has its origin in the melanoblastic cells at the epidermodermal junction and not in deeply lying nævus cells as has been sometimes supposed.

"Melanotic epithelioma" and "pigmented epithelioma" are terms used to designate a benign epidermal neoplastic tumor containing considerable melanin. Lesions of this type are closely related to the so-called senile or seborrhœic verruca and almost never undergo malignant degeneration. In a study of cutaneous carcinomata it was found that 33 per cent of the basal-cell tumors, 14 per cent of the intermediate-cell tumors, 9 per cent of the mixed-cell tumors, and 7 per cent of the squamous-cell tumors contained melanin demonstrable by the silver technique. The pigment in these tumors is due to the presence of melanoblasts which cannot be distinguished from normal melanoblastic cells on the basis of the type and arrangement of the melanin granules. In rather unusual cases carcinoma of the

## INTERNATIONAL ABSTRACT OF SURGERY

breast which has invaded the skin is intimately associated with melanoblastic cells which are normal  
JOSEPH K. NABAT, M.D.

Gomes da Costa, R. P. The Action on Certain Fermentative Processes in Tumor Tissues of Substances That Cause Hypoglycemia. *Arquivos de patologia hipoglicemica e sobre outros processos fermentativos do tecido neoplásico* Arq de Patol 1934, 6, 5

Wherry showed the important part played by carbohydrates in the metabolism of cancer tissue. There are many similarities in the changes of metabolism in diabetes and cancer. The effects produced by insulin in diabetes and cancer are very similar to those produced by radium in cancer. These facts led the author to make a study of the effects produced by substances that cause hypoglycemia on carbohydrate metabolism in tumor tissues. From an investigation he draws the following conclusion:

Insulin injected into tumor tissues, from causes decrease in the size of the tumor but not its complete disappearance. In animals painted with tar, insulin retards the development of tumor. Mice with cancer are more resistant to the action of large doses of insulin than normal animals. Anticancerous tumor tissues contain a substance that causes hypoglycemia, an insulinoid. This substance is more abundant in tumor tissues than in normal tissues. Insulin, even in low concentration, prevents the development of cultures both of normal and tumor tissues. Cancer tissue is more sensitive to this action than normal tissues. Very weak concentrations of insulin may favor the development of cultures of tumor tissue.

Insulin increases the consumption of glucose in cultures, particularly when it inhibits their development. Both stable and unstable glucose can be demonstrated in the blood of persons with cancer. The amount of the latter is less than the amount in normal blood, and greater than the amount in blood of diabetics. Possibly insulin causes the production of unstable glucose in the blood of persons with cancer but this is less marked than in the blood of diabetics. As in normal individuals, glucose is found in the serum of diabetics and persons with cancer, not in its colloidal form, but in solution and not combined with proteins.

Irradiation of the hind legs of normal rabbits in small doses causes hypoglycemia, and in large doses, hypoglycemia. After irradiation of tumors in dogs there is hyperadrenalinemia and hypoglycemia. In normal or diabetic dogs and men irradiation causes hyperadrenalinemia and hypoglycemia. In rabbits with tumors the hypoglycemia caused by irradiation is more prolonged than that caused by hypoglycemia in normal rabbits. The percentage of hypoglycemia in Ehrlich adenocarcinoma in mice decreases as the development of the tumor progresses. This is true of the glycogen of the liver which is smaller in amount than tumor glycogen. Irradiation

of tumor-bearing animals causes a decrease of glycogen both in the tumor and in the liver. If the tumor is irradiated directly there is a more marked decrease of glycogen in the tumor than in the liver. If neither the tumor nor the liver is irradiated directly the decrease of glycogen is greater in the liver than in the tumor.

In mice with adenocarcinoma the injection of insulin with glucose causes a decrease of glycogen in the tumor and particularly in the liver. In animals with cancer insulin does not further the synthesis of glycogen in the liver as it does under normal conditions. The percentage of lactic acid in the tumor and blood is much higher in persons with cancer than in normal individuals. The metabolism of the cancer cell is partly a metabolism of oxidation and partly a metabolism of fermentation. Anaerobic glycolysis is the only known metabolic function which is compatible with intense proliferation of tumor cells. Insulin when very greatly diluted increases respiratory and decreases glycolysis in tumor tissues. High concentrations decrease respiration and increase glycolysis. With still stronger concentrations the action is reversed.

The reducing power of tumor tissue is greater than that of normal muscle tissue. Glutathione is less than normal in man and animals with cancer. Insulin increases glutathione in animals with tumor. The action of insulin, guanidine, morphine, and codein on the reducing capacity of muscle is stimulating or paralyzing, depending on the concentration. Increase and decrease alternate as the concentrations increase. This is true also in tumor tissue which seems to be more sensitive to these actions than normal muscle tissue.

The local application of insulin in the proper dose brings about cicatrization of cancerous ulcers of the skin and retrogression of tumor tissue. Other substances which cause hypoglycemia, such as guanidine, Synthalin A and B, morphine, codein, ergotamin, and extract of galega, may also cause cicatrization of cancerous ulcers of the skin in proper doses. Doses of morphine, ergotamin, and galega which produce hypoglycemia cause increased growth of tumor tissue. The alkaloids of opium which do not cause hypoglycemia cause increased effect on skin cancers.

Röntgen ray irradiation in doses of from 2,500 to 3,500 r cause only epilation and epidermal desquamation of the skin of the rabbit. Doses of from 3,500 to 4,000 r cause epidermitis. The dermis is exposed, rubbed locally with vasoline and covered with a rubber locally. This does not result. If insulin is irradiated, all of the skin reactions of the rabbit. These symptoms appear earlier and are more intense in the thigh that has been treated with insulin than in the skin of the thigh that has not been so treated. The injection of insulin does not sensitize the treated rabbits to the action of röntgen rays.

Irradiation decreases the oxidation-reducing capacity of the muscles and particularly that of tumor

## MISCELLANEOUS

tissue. Irradiation of muscle by roentgen rays *in vitro* with a dose of 300 r increases the oxidation-reducing capacity of the tissue, but this has not been confirmed by irradiation *in vivo*. Insulin intensifies the action of muscle and particularly on that of tumor capacity of muscle and particularly on that of tumor tissues except in cases in which a very strong or a very weak dose of insulin in itself increases the oxidation-reducing capacity. Under the latter circumstances the association of insulin and roentgen rays seems to increase the oxidation-reducing capacity of muscle, and particularly tumor tissue, still further. Ulcerated tumors of the skin which are resistant to irradiation do not heal readily under the local action of insulin, but preliminary application of insulin overcomes the radioresistance and intensifies the action of the rays to such an extent that the ulcers can be healed by one-half or one third of the dose of irradiation that proved ineffective before. Ulcers which often give rise to malignant tumors may be healed by the local application of insulin.

AUDREY GOSS MORGAN, M D

Casey, A E The Experimental Alteration of Malignancy with a Homologous Mammalian Tumor Material I Results with Intratesticular Inoculation *Am J Cancer*, 1934, 21 760

Many investigators have reported that the injection of devitalized cells from embryonic, mammary, and tumor tissues will increase the susceptibility of rats and mice to tumor transplantation. This "manuring of the ground" was brought about by injecting an emulsion of the devitalized cells subcutaneously ten or fifteen days before the tumor inoculation. The action of the materials was estimated from the effects on the primary tumor. The occurrence of metastases and phenomena of true malignancy were not used as criteria.

In the experiments reported by Casey the effects of the parenteral injection of a homologous tumor material two weeks prior to tumor inoculation were studied in relation to the growth and malignancy of the Brown-Pearce rabbit tumor. Groups of rabbits injected intratesticularly with this material and inoculated with the tumor two weeks later in the same or the other testicle were compared with control groups inoculated with the tumor only. During a period of two months the material did not of itself produce a tumor or any evidence of an inflammatory tissue hypersensitivity in the testicle. However, it was found to alter the course of the malignant disease in the direction of increased malignancy. The effect was observed not only in the incidence and the size of the primary growth, but also in the incidence, number, size, and distribution of the metastases. The time of occurrence of paralyzes and the length of life of animals dying from the tumor were definitely shortened and the mortality from the disease was increased.

The nature of the substance concerned is still unknown, but evidently the substance is not present in fresh and actively growing tumor tissue in an

active form or in such tissue is associated with a substance or substances capable of masking or suppressing its activity. It is present in tumors which have been removed from animals and preserved for a period of ten days or more and in tumors left undisturbed and preserved in the animal body. The time required for its development or activation and the time during which it persists in an active state in preserved tissue are still unknown, but experiments have shown that the active agent is separable from intact cells and that the effects produced by emulsions of preserved tissue can be obtained also by the use of desiccated material and cell-free filtrates of such emulsions. However, in all cases the active material has been obtained from a tumor of the same kind and not from any other tumor or tissue. It is therefore a strictly homologous material.

With reference to the action of this agent, the author points out that, so far, there is no evidence that the injection of the material produces a local sensitization. The effects are general rather than local. Moreover, they are not transient but enduring, a fact constituting additional evidence of the profound systemic action of the material. Moreover, experiments with mouse tumors have revealed the existence of at least two other homologous tumor-enhancing materials, one present in a mouse sarcoma and the other in a mouse carcinoma, each of which differs both from the other and from the rabbit-tumor material.

JOSEPH K. NARAT, M D

Casey, A E The Experimental Alteration of Malignancy with Homologous Mammalian Tumor Material II Intracutaneous Inoculation of Preserved Material *Am J Cancer*, 1934, 22, 776

Experiments were carried out to determine whether a homologous tumor material which enhanced every observed phase of the rabbit tumor following intratesticular inoculation would have a similar effect following the intracutaneous inoculation of the Brown-Pearce rabbit tumor into the flank. Groups of rabbits which received injections of the tumor in the skin of the flank and inoculated with the tumor in the same or a neighboring area two weeks later were compared with control groups subjected only to tumor inoculation.

The results in the control animals confirmed the previous observation that the rabbit tumor which is malignant following intratesticular inoculation is a spontaneously regressing, non metastasizing growth following intracutaneous inoculation into the flank. However, in the experimental animals which had been treated with the homologous material more rapidly growing and persistent local tumors occurred more frequently. Moreover, distant metastases were discovered in a large percentage of the animals. Therefore, in enhancing both the primary and the metastatic phases of malignancy the preserved material is not dependent upon intratesticular inoculation and is able to overcome the natural resistance of the rabbit's skin to the tumor. The

action of this material was not affected by sex or immaturity.

During the observation period of six months there was no evidence that the preserved material will of itself produce tumor growth. After from four to ten days no palpable lesion remained at the site of the injection of the preserved material and the animals showed no clinical signs of illness or an infectious process. An injection of fresh tumor tissue followed two weeks later by a second inoculation of living tumor did not result in more malignant course of the disease. Therefore the phenomenon of enhancement is not due to the cumulative effect of repeated doses of tumor tissue, but must be explained on some other basis. Berkeley & Lillatres of the preserved material have the same potency as the unfiltered emulsion. JOSEPH K. NARAT, M.D.

Price, L. W. Metastases in Squamous Carcinoma. *Am. J. Cancer* 1934, 2.

With the possible exception of those in the local lymphatic glands, secondary deposits of squamous carcinoma are somewhat rare. The problem as to what factors determine their development in one case of squamous carcinoma and their absence in clinically similar case has not been satisfactorily solved.

In a series of 158 consecutive uteruses carried out at the Glasgow Royal Cancer Hospital in cases of squamous carcinoma of various regions of the body the primary site and the sites of distant metastases were found to be as follows:

	Total cases	Cases with metastases
Tongue	40	6
Floor of mouth	37	
Lip	8	
Face and pharynx		
Larynx	7	
Esophagus		4
Vagina	8	
Cervix uteri	3	3
Penis	4	
Skin	7	
Nasal duct	18	19

Price reports clinical study regarding the possible etiological relationship to the development of metastases of (1) the patient's age, sex, and general condition, (2) the duration of the disease, (3) the rate of growth of the primary tumor (4) the interval between the appearance of the primary tumor and the development of metastases, and (5) the degree of destruction of normal tissues. His findings and conclusions are summarized as follows:

The evidence of general consideration of the relationship between the clinical and pathological findings indicates that there is no correlation between the clinical condition of the patient and the development of distant metastases.

1. There is no constant relationship between the site of the primary tumor and the site of the distant

metastases. The most common sites of metastases in the cases reviewed were the lungs (5 cases), the liver (7 cases), and the kidneys (5 cases).

2. In a wider study of the development of metastases from numerous primary tumors of various types, the only definite findings are that tumors arising in certain primary sites have a tendency to form metastases in certain tissues and that there is peculiar relationship between the site of the primary tumor and the sites of the secondary deposits. JOSEPH K. NARAT, M.D.

## DUCTLESS GLANDS

Davis, L. The Relation of the Hypophysis, Hypothalamus, and the Autonomic Nervous System to Carbohydrate Metabolism. *Am. Surg.* 1934, vol. 6-54.

In an attempt to explain some of the vagaries of disturbed carbohydrate metabolism in cases of disturbances of the hypophysis and the related structures, the author carried out three series of experiments on rats. In the first series the pancreas was removed and later the hypophysis was damaged with the Horsley-Clarke stereotaxic apparatus. In the second series the lesions were produced in the hypothalamus so that the hypophysis was spared, and the pancreas was then removed. In the third series, stimulation experiments were carried out on the autonomic nervous system.

In the one animal of the first series that survived the operative procedure there was no ensuing evidence of diabetes. The needle had entered in the midline, passing through the third ventricle. The lesion destroyed a segment of the anterior lobe of the hypophysis and small part of the pars nervosa, and had caused slight damage to the pars tuberalis. The infundibulum seemed to be at least partly blocked by scar tissue, and the pars tuberalis was slightly hypertrophied with acid greatly distended by colloid. The postoptic commissure, the ventral periventricular nuclei, and the gray substance of the tip of the tuber fast rostrad to the infundibulum were damaged or entirely destroyed. In the light of the work of those who believe that the products of hypophyseal secretion pass from the pars intermedia by way of the tissue spaces in the pars nervosa to stimulate the tuberal and other anterior hypothalamic nuclei, it is interesting to note that in this animal the infundibulum was partially blocked and the space separating the pars intermedia from the anterior lobe was distended and contained a large amount of homogeneous material. It has been suggested that as a result of nervous impulses from the hypothalamic nuclei, ripened secretory cells are cast off, invade the pars nervosa, and become hyaline bodies which make their way through the pars nervosa toward the infundibular cavity.

In the second series of the author's experiments it was found that in the animals which survived the pancreatectomy following the hypothalamic injury the hypothalamic lesions were placed so that they

involved the region of the fornix and affected the perifornical nuclei. They were situated in the tuber cinereum, where their position was slightly rostral-lateral to the mammillary bodies. It is at about this level that the ventromedial hypothalamic nuclei lies. The lesions in the animals which did not survive the paraneurectomy did not seriously affect this region or left it entirely unscathed on one side of the hypothalamus. The evidence indicates that the hypothalamic lesion must be not only in a given area but also bilateral and symmetrical.

Stimulation of the superior cervical sympathetic ganglion or the stellate ganglion results in elevation of the blood sugar and glycosuria but in the author's experiments in which hypothalamic lesions were produced such stimulation did not result in glycosuria. The conclusion is drawn that the glycosuria is the result of the stimulation of the hypothalamic nuclei by the hypophyseal substance which in turn results from the sympathetic stimulation.

JOHN WILSON LEROY, M.D.

Ellison, I. T., and Wolfe, J. M. The Effect of Castration on the Anterior Hypophysis of the Female Rat. *Endocrinology*, 1934, 18, 5-5.

That, in rats, castration leads to an increase in the relative number and the size of the basophilic elements of the anterior lobe of the hypophysis which become molting and give rise to the so-called castration cells appears fairly definitely established. However, with regard to the changes in the eosinophiles there is no consensus of opinion. Therefore the authors studied the effects of castration in male and female rats at definite intervals after castration. These studies were both quantitative and qualitative. Differential cell counts were combined with an analysis of the morphological changes. The work was controlled by observations on 40 normal female rats, and due cognizance was given to the studies (Wolfe and Cleveland) on the histology of the anterior lobe of the hypophysis of the female rat in relation to the cell types.

The results of the study of the hypophyses of 100 female rats from which the ovaries had been removed from five to five hundred days previously were as follows:

From five to fifteen days after castration the cells of Type 3 often exhibited a granular loss. After this time they rapidly increased in size and became packed with granules which stained deeply with aniline blue. At about the thirtieth day after castration, large colloid vacuoles appeared in these cells and typical 'signet ring' castration cells were observed. In thirty day castrates the average percentage of these cells was 14.2 as compared with 4.6 in normal non castrated females. From the thirtieth day after castration there was a gradual decrease in the percentage of the basophilic elements.

In animals castrated for thirty days, the percentage of castration cells was low (0.9). Thereafter, the

number of these cells increased rapidly. In animals castrated for one hundred eighty days their mean percentage was 13.0 per cent. During the same period the percentage of cells of Type 3 decreased.

During the first sixty days of castration there was a moderate increase in the percentage of cells of Type 1 (eosinophiles). Later, these cells tended to decrease in number.

There was no morphological change in the cells of Type 4 (chromophobes) after castration.

Colloid accumulated in the residual cleft following removal of the ovaries. A. F. J. LERN, M.D.

Aitken, R. S., and Russell, D. A Case of Simmonds' Syndrome. *Lancet*, 1934, 227, 802.

The authors describe the clinical and pathological features of a case of Simmonds' syndrome—the syndrome of pituitary cachexia—which appeared after destruction of the pituitary gland by hemorrhage and a chromophobe adenoma of the anterior lobe of that gland. SAMUEL KAHN, M.D.

Bratton, A. B., and Field, A. B. A Case of Simmonds' Disease. *Lancet*, 1934, 227, 805.

In the case reported by the authors a long series of pregnancies was followed by progressive weakness and debility, amenorrhea, loss of pubic and axillary hair, headache, vomiting, anorexia, and a subnormal temperature. At one time the symptoms suggested a mild degree of hyperthyroidism. Autopsy disclosed lymphadenoid infiltration of the pituitary gland, destruction of both the anterior and posterior lobes of that gland by fibrosis, and atrophy of the other endocrine glands and other organs.

Unusual features were the absence of obvious wasting and the destruction of the posterior lobe of the pituitary gland by the fibrosis. However, cachexia was not invariably present in the cases of Simmonds' disease previously reported. When the anterior lobe of the pituitary gland is destroyed by fibrosis the posterior lobe almost always escapes.

SAMUEL KAHN, M.D.

Grasso, R. The Possibilities of Local Injury to the Tissues from Injections of Adrenalin and Adrenalinized Solutions (Sui possibili danni locali delle iniezioni di adrenalina e delle soluzioni adrenalizzate). *Arch. ital. di chir.*, 1934, 37, 1.

The lesions resulting from the parenteral administration of adrenalin range from simple non microbic necrosis, which is most frequent after the use of adrenalinized solutions for hypodermoclysis or infiltration anesthesia, to fulminating gaseous or gangrenous phlegmons following the intramuscular injection of such solutions. The thirteen cases of lesions of the latter type which have been reported obviously represent only a small percentage of the total number. Grasse has recently observed three cases of gangrenous (pyogenic) phlegmons.

In this article he reports a number of experiments—apparently the first on the problem—to determine the relative importance of adrenalin *per se* and of

bacteria in the production of such lesions. A phlegmon was never produced by the mechanism of endogenous infection (the production of a bacilleraemia followed by the intramuscular injection of adrenalin). When intramuscular injections of infected solutions of adrenalin were given, abscesses were produced in 80 per cent of the experiments in which taphylococci were used, gaseous gangrene in 00 per cent of those in which the bacillus perfringens was used, and moist gangrene in 70 per cent of those in which the bacillus of malignant edema was used. Control tests with similarly infected solutions of various other drugs were negative. Even more heavily contaminated adrenalin solutions injected into richly vascularized organs such as the tongue and myocardium never caused phlegmons, and in tissues of the ear or leg rendered hyperemic by a sympathetomy they produced only mild lesions.

Sterile adrenalin solutions did not cause local lesions but contaminated adrenalin solutions often caused immediate death with the picture of acute pulmonary edema when given in less than the lethal dose. Sterile adrenalin solutions from flasks (the type for general surgical use) always caused extensive non-progressive necrosis. Adrenalinized salt or glucose solutions for hypodermoclysis never produced necrosis.

The favorable influence of adrenalin on bacterial growth is due to its vasoconstrictive action which retards absorption and decreases local defenses. Possibly there is also concomitant toxic action.

The presence of bacteria retards absorption, thus increasing the deleterious local effect. Sterile adrenalin passes quickly into the circulation, causing no local damage but overwhelming the heart.

Clinically concomitant factors such as conditions which reduce local resistance and such as the tendency toward alkalineemia and disturbances of the sympathetic nervous system in bronchial asthma, are of more importance than contamination of the solution.

From his findings Grams concludes that any substance injurious to the tissues or having a vasoconstrictive action should be injected very slowly with the most scrupulous precautions for asepsis and that afterward the site of the injection should be massaged energetically and hot air bag should be applied for several hours. When the peripheral circulation is precarious, adrenalin should either be avoided or given intravenously. For infiltration anesthesia, adrenalin preparations of the hypodermic type should be used. Adrenalinized solutions should not be employed in conditions known to favor necrosis. The only prevention of endogenous infection is, possibly the avoidance of adrenalin in the presence of an acute intestinal disturbance. The physician should not be held responsible legally for the occurrence of adrenalin gangrene.

The author's cases and experiments are reported in detail. The article contains illustrations and is supplemented by an extensive bibliography.

J. E. Moore, M.D.

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NOTE—THE BOLD FACE FIGURES IN BRACKETS AT THE RIGHT OF A REFERENCE INDICATE THE PAGE OF THIS ISSUE ON WHICH AN ABSTRACT OF THE ARTICLE REFERRED TO MAY BE FOUND

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## CONTENTS

I	Authors of Articles Abstracted	II	
II	Index of Abstracts of Current Literature	III-VII	
III	Abstracts of Current Literature	193-272	206
IV	Bibliography of Current Literature	273-296	206
			206
			212

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# AUTHORS OF ARTICLES ABSTRACTED

- Balado, M 301  
 Barlow, O W 250  
 Bayly, L 258  
 Baynard, M 246  
 Beer, E 35  
 Beers, J 209  
 Bertha, D D 97  
 Bertolotto, U 262  
 Black, A 267  
 Blumgart, H L 97  
 Bonney, V 5  
 Bowman, H H 236  
 Browner, G 97  
 Brown, G E 204  
 Bruckner, F 209  
 Bucura, C 19  
 Bugha, H G 237  
 Buncio, A 28  
 Carro, H 20  
 Canavero, M 245  
 Castagna, P 30  
 Caffin, J R 228  
 Cella, C 243  
 Chiles, R V 24  
 Chisholm, A E 223  
 Christensen, F A 217  
 Ciceri, C 209  
 Coakley, C G 99  
 Coates, G M 21  
 Collier, F A 242  
 Collier, W A 26  
 Connors, J E 93  
 Corry, P M 207  
 Cotter, G 215  
 Craig, W McK 204  
 Crumpton, H P 250  
 Cramer, L F 232  
 Critchley, M 264  
 Curren, S J 283  
 Carter, M 241  
 Dall'Acqua, V 28  
 Darnach, W 247  
 De Dombrowski, S 21  
 De Lange, M 28  
 De Lorenz, A 243  
 Deussen, 235  
 Desbordes, O  
 Desbordes, H  
 Desjardins, A U 203  
 Déré, F 267  
 Dill, J L 230  
 Dodd, H 246  
 Donald, C 201  
 Donnelly, H H 268  
 Donovan, H 297  
 Ducking, J 33  
 Echols, O H 203  
 Edwards, A T 203  
 Ederstein, 270  
 Ennos, M S 95  
 Faxon, H H 243  
 Fedorovich, D 57  
 Fife, G L 20  
 Finkle, P 37  
 Fitch, F B 264  
 Florry, H W 257  
 Flukens, C F 230  
 Franceschi, E 254  
 Funtl, O 25  
 Fraser, L 221  
 Fraser, C H 202  
 Freeman, N E 240  
 Fuchs, R E 20  
 Froese, G 226  
 Gabrich, B 262, 272  
 Galloway, C E 26  
 Gashof, A 270  
 Gasser, C 206  
 Gaudier, J 270  
 Gebirg, H 212  
 Geedricher, C F 237  
 Gey, G O 203  
 Olmed, 220  
 Geyman, J 2  
 Graves, R C 250  
 Gualtieri, F 23  
 Gurnea, F J 24  
 Harniman, A C  
 Harberg, H E 222, 257  
 Harris, W 30  
 Harniman, J 203  
 Henry, A K 246  
 Harper, C C 240  
 Hensberg, B 20  
 Heymann, T 232  
 Hodges, A C 39  
 Hoover, W E 26  
 Hoyte, C 96  
 Hunt, A F  
 Ignotz, B H 245  
 Jones, R M 224  
 Joffe, T M A 220  
 Jopson, B 240  
 Jones, H 202  
 Jones, G 209  
 Kone-Apalahtti, L 296  
 Kurita, T J 240  
 Kuster, O H 243  
 Kuznetsov, 35  
 Krebschauer, H L 27  
 Krohn, C 204  
 Krombhaar, L B 3  
 Kneaster, H 23  
 Lange, M 244  
 Lehman, E P 203  
 Lewis, M 200  
 Leucuta, T 22  
 Levy, 35  
 Levy, D 20  
 Lescure, G 27  
 Lissenden, T 209  
 Lissenden, B 242  
 MacDonald, D 244  
 MacKenzie, J K 200  
 Mackay, W A 223  
 Macrae, T F 209  
 Maddock, W O 248  
 Mahan, J W 206  
 Mancott, R L 24  
 Mathers, J 225  
 Mathers, R D 97  
 McCann, H A 203  
 McCarty, G A 20  
 McLachlan, H C 204  
 Meyer, G 254  
 Mikawa, L A 243  
 Mizen, R 250  
 Minter, C O 97  
 Morison, P 226  
 Morris, J J 245  
 Mortimer, R L 207  
 Mowbray, 35  
 Myers, D 295  
 Nathanson, L 20  
 Nicholson, M M 208  
 Nogata, G 214  
 Nordland, U 212  
 Oppenheimer, B B 235  
 Owsen, J C 204  
 Overton, J C 93  
 Packham, T 26  
 Pagani, F 212  
 Pardi, R 208  
 Parkman, J 96  
 Patry, D H 3  
 Paul, R G 223  
 Pavone, E F 207  
 Paul, M M 203  
 Pflieger, G E 242  
 Pengross, A 217  
 Pinner, E 24  
 Potter, A L 220  
 Puccini, L 27  
 Rabboni, F 27  
 Redi, R 215  
 Reichbach, R 204  
 Ripetto, E 26, 30  
 Riba, L W 237  
 Ritter, C 27  
 Robb, D 24  
 Rossi, E 242  
 Schaefer, H 23  
 Schaper, L 259  
 Schoenberg, M J 202  
 Schwarz, G 3  
 Scott, S 202  
 Sedakoff, G 209  
 Short, A R 223  
 Simpson, 35  
 Slov, L F 229  
 Sponka, A 232  
 Stappert, E 209  
 Smithwick, R H 228  
 Smithwick, W 206  
 Soliman, N 264  
 Strauss, B B 247  
 Stone, H B 294  
 Stow, A F 99  
 Symons, D 206  
 Thomsen, J 227  
 T. H. H. K. 298  
 Thomsen, A 240  
 Thomas, C P 208  
 Tschopp, G H 228  
 Valachi, R 28  
 Vantine, J H 268  
 Victor, J 264  
 Walker, A E 204  
 Wallace, H L 220  
 Wallgren, A 263  
 Weiss, A 230  
 Wessinger, L 226  
 Wetterdal, F 226  
 Wernli, L B 220  
 White, J C 209  
 Wislizenus, A 237  
 Wislizenus, W 244  
 Wright, L T 295  
 Zander, F 217  
 Zephero, do Anasal, 30  
 Zolotarev, A 3

# CONTENTS—MARCH, 1935

## ABSTRACTS OF CURRENT LITERATURE

### SURGERY OF THE HEAD AND NECK

- Head**
- CONNORS, J. F., and WRIGHT, L. T. Fractures of the Skull 193
- DILL, J. L., and CROWT, S. J. Thromboses of the Sigmoid or Lateral Sinus Thirty Cases 103
- KROM, C. The Treatment of Fractures of the Neck of the Mandible, Especially in Children, and the Results Obtained in a Few Cases 194
- REICHENBACH, E. Fracture Dislocations of the Head of the Mandible 194
- Eye**
- SCHROENBERG, M. J. Retinal Detachments Clinical Experiences with the Diathermic Treatment 195
- Ear**
- COATES, G. M., FESNER, M. S., and MYERS, D. Roentgen Changes in the Petrous Portion of the Temporal Bone Without Clinical Manifestations 195
- Nose and Sinuses**
- SPIELBERG, W. The Pathology of Chronic Sinusitis in Children 196
- Pharynx**
- HOOVER, W. B. The Treatment of the Lingual Tonsil and Lateral Pharyngeal Bands of Lymphoid Tissue 196
- Neck**
- KENA APAJALAHTI, L. Myxœdema in Children 196
- PARKINSON, J., and HOYLE, C. Thyrototoxic Hypertension 196
- McCLURE, R. D. Thyroid Surgery as Affected by the Generalized Use of Iodized Salt in an Endemic Goiter Region, Preventive Surgery 197
- MINTER, C. G., BLUMGART, H. L., and BERLIN, D. D. Total Ablation of the Thyroid for Angina Pectoris and Congestive Heart Failure 197
- BRENNER, O., DONOVAN, H., and MURTAGH, B. L. S. Total Thyroidectomy in the Treatment of Congestive Heart Failure 197
- STONE, H. B., OWINGS, J. C., and GEY, G. O. Transplantation of Living Grafts of Thyroid and Parathyroid Glands 198
- TAYLOR, H. K., and NATHANSON, L. A Roentgenological Study of Tuberculosis of the Larynx and Neck 198

- LENZ, M., COAFLEY, C. G., and STOUT, A. P. Roentgen Therapy of Epitheliomata of the Pharynx and Larynx 199
- MACKENY, J. E. Malignant Disease of the Larynx Rare Types, Premalignant Conditions, and Conditions Simulating Malignancy 200

### SURGERY OF THE NERVOUS SYSTEM

- Brain and Its Coverings, Cranial Nerves**
- WALKER, A. F. Cephalography in Children 201
- CAIRNS, H., DONALD, C., SCOTT, S., ORMEROD, F. C., and OTHERS. Discussion on the Diagnosis and Treatment of Abscess of the Brain 201
- BALADO, M., and PARDAL, R. Surgical Treatment of Hypophyseal and Perihypophyseal Tumors 202
- FRAZIER, C. H. Bilateral Trigeminal Neuralgia 202
- Spinal Cord and Its Coverings**
- PEET, M. M., and ECHOLS, D. H. Herniation of the Nucleus Pulposus A Cause of Compression of the Spinal Cord 203
- LEIDY, F. P. Uretero-Arachnoid (Ureterodural) Anastomosis 203
- Sympathetic Nerves**
- CICERI, C., and GABRIELLI, S. Studies on the Variations of Alimentary Glycemia Induced by Alcohol Injection of the Splanchnics Attempts to Cure Diabetes Mellitus 203
- CRAIG, W. McK., and BROWN, G. E. Unilateral and Bilateral Resection of the Major and Minor Splanchnic Nerves Its Effects in Cases of Essential Hypertension 204
- SMITHWICK, K. H., FREEMAN, N. E., and WHITE, J. C. The Effect of Epinephrin on the Sympathectomized Human Extremity An Additional Cause of Failure of Operations for Raynaud's Disease 249
- SURGERY OF THE CHEST**
- Chest Wall and Breast**
- GARNIER, C. The Surgical Treatment of Funnel Chest 206
- HEITMAN, J. The Study of Benign Neoplasms of the Rat's Breast 206
- MALPATAK, J. W. The Prevention of Necrosis in Plastic Repair of the Breast 206
- GEURKE, H. The Relationship of the So-Called Umbilical Adenomata of the Apocrine Sweat Glands and Adenofibrosis of the Breast 212

## Trachea, Lungs, and Pleura

- PEARSON, E. F. Non-Parasitic Cystic Diseases of the Lungs: Its Clinical Recognition and Treatment 507
- CORTILOS, P. M. Thoracoplasty Versus Pneumothorax 507
- JERRY, H. Thoracoplasty in Bilateral Cavernous Tuberculosis 508
- EDWARDS, A. T. and THOMAS, C. P.: One-Stage Lobectomy for Bronchiectasis: An Account of Forty-Eight Cases 508
- McINTOSH, H. C. Changes in the Lungs and Pleura Following Roentgen Treatment of Cancer of the Breast by the Prolonged Fractional Method 514

## Heart and Pericardium

- MIXTER, C. G., BLUMHART, H. L. and BRIDLE, D. D. Total Ablation of the Thyroid for Angina Pectoris and Congestive Heart Failure 497
- BRIDGER, G., DOWDALL, H. and MURTAGH, B. L. S. Total Thyroidectomy in the Treatment of Congestive Heart Failure 497
- BERKMAN, J. Tuberculous Pericarditis 498
- JONES, G. Cardiac Symplysm, Brauer's Operation 498

## Esophagus and Mediastinum

- HILKES, B. The Anatomy of the Abdominal Portion of the Esophagus 499

## SURGERY OF THE ABDOMEN

## Abdominal Wall and Peritoneum

- DEBOWYCH, G. and DUBOIS, H. Prevascular Femoral Hernia 51
- GARRETT, H. The Relationship of the So Called Umbilical Adenoma to the Apertine Secret Glands and Adenocarcinoma of the Breast 51
- REPERTO, E. Fibrosis of the Anterior Abdominal Wall 51
- NORMAN, U. So-Called Primary Cryptogenic or Metastatic Striptococcal Peritonitis 513

## Gastro-Intestinal Tract

- NOLAN, G. The Nature of the Healing of Surgical Wounds of the Stomach in Relation to the Technique of Suture Employed 514
- LAMARCA, F. The So Called Enterocystic Gland Lesions 514
- LORENZINI, G. The Suprapubic in Acute Intestinal Obstruction 514
- PUGH, A. Duodenal Diverticula 514
- DALL AGO, V. and VALERIO, R. The Roentgen Appearance of the Normal Mucosa of the Colon 514
- WATKINS, L. B. and WALLACE, H. L. Acute Appendicitis 514
- GALLAGHER, J. and WHEAT, A. The Pathogenesis and Treatment of Proliferating and Straining Proctitis 514
- BOWEN, H. H. and FRICK, R. E. Primary Rectal Carcinoma under Radiation Treatment 514
- HERRIT, A. F. Anal Adenoma and Megacolon 514
- MIRRETT, K. A Study of Appendicitis in Gynecology 514

## Liver, Gall Bladder, Pancreas, and Spleen

- HANCOCK, A. C. Jaundice 515
- PAGLIAR, F. The Behavior of Calcium in Bone After Total Extirpation of the Gland 515
- HARRING, H. L. The Secretion of Mucin by the Epithelial Cells of the Gall Bladder and the Experimental Production of Mucocoele 515
- SHOOT, A. R. and PAUL, R. G. Tarsen of the Gall Bladder 515
- MADLEY, W. A. Cholecystitis Without Stones 515
- PARRY, D. H. The Experimental Production of Cholelithiasis (Strawberry) Gall Bladder 515
- MARSHALL, R. L. and CARRUT, R. V. Acute Cholelithiasis 515
- JAMES, R. M. Pancreatic Fistula: Report of Case Cured by Pancreatogastrostomy 515

## GYNECOLOGY

- Uterus 515
- BOYER, V. The Principles That Should Underlie All Operations for Prolapse 515
- FRANK, G. The Mucosal Vessels of the Striking Uterus 515
- COTTE, G. and MATHIAS, J. Cases of Spontaneous Fibrosis Occurring During the Course of Development of Uterine Myositis 515
- WATKINS, P. Does the 3-Diagnostic Diagram Afford Prognostical Guidance in Cervical Cancer? 515
- FROST, G. and WETTER, K. The Progression of Carcinoma of the Uterus in the Youngest 515
- GALLOWAY, C. D. Schiller's Test for Early Squamous Cell Carcinoma of the Cervix 515
- POCROFT, L. Leucoplakia and Cancer of the Cervix 515
- TAYLOR, P. J. Ilac Lymphadenectomy with Irradiation in the Treatment of Cancer of the Cervix 515
- TURBET, G. R. and CARROLL, A. E. On the So-Called Serosa of the Endometrium 515
- MORROW, P. and DE LAUNAY, M. Excisions of the Body of the Uterus 515
- BURKE, H. G. Uteral Ostomy Following Radiation Implantation into the Cervix 515
- Adnexal and Peritoneal Conditions 515
- FURMAN, C. F. The Nature of Ovary Stimulating Hormones 515
- JEFFCOATE, T. N. A. and POTTER, A. L. Endometriosis as Manifestation of Ovarian Dysfunction 515
- Miscellaneous 515
- BODEN, C. Guidelines with Respect to the Clinical Aspects of Gonorrhea in the Female 515
- PACALOFF, T. Studies on the Gonorrhea, Its Specificity and Its Behavior in Postmenstruation 515
- METCAL, K. A Study of Appendicitis in Gynecology 515
- CARTER, P. Experimental Investigations Regarding the Relationship Between the Thyroid Gland and the Genital Organs of Immature Female Rabbits Treated with Pregnancy Hormones 515

BRUTOLOTTO, U Roentgen Therapy of Gynecological Inflammations

## OBSTETRICS

Pregnancy and Its Complications

SCHWARTZ, G Habitual Abortion

Labor and Its Complications

SJÖVALL, A A Study of the Prognosis and Management in Brow Presentation

HEYNEMANN, T Spontaneous Transformation of a Face Presentation into an Occiput Presentation During the Period of Expulsion

Puerperium and Its Complications

KUESNER, H Increasing the Secretion of Milk with Anti Thyroid Protective Substances

DICKING, J, and GUILHEM, P Obstetrical Phlebitis of the Subacute Venous Septicemia Type

Newborn

DONNALLY, H H, and NICHOLSON, M M A Study of Vaccination in 500 Newborn Infants

Miscellaneous

PONZI, C Evaluation of Clinical Statistics on the Relations Between Parturition and Pathological Obstetrics

## GENITO-URINARY SURGERY

Adrenal, Kidney, and Ureter

LUCARELLI, G The Suprarenals in Acute Intestinal Occlusion

RABONDI, F The Behavior of the Lactic Acid of the Blood in Suprarenal Insufficiency

BEER, E, and OPPENHEIMER, B S Transplantation of the Adrenal Cortex for Addison's Disease

SIMPSON, LEVI, DENTON, and KORENCHINSKY Some Effects of Adrenalectomy in Male Rats

REDI, R Traumatic Lesions of the Kidney and Their Treatment

LIOY, D Clinico-Operative Considerations on Cases of Painful and Hematuric Nephritis

MCCURDY, G A Renal Neoplasms in Childhood

GESCHICKTER, C F, and WIDENHORN, H Nephrogenic Tumors

BUGBEE, H G Ureteral Occlusion Following Radium Implantation into the Cervix

Bladder, Urethra, and Penis

RIBA, L W, and CHRISTENSEN, F A Urinary Bilharziasis

KRETSCHMER, H L Diverticulum of the Bladder in Infancy and in Childhood

FRANCESCHI, E Radical Curettage of the Posterior Urethra

GRAVES, R. C The Treatment of Malignant Disease of the Penis

Genital Organs

263 KIRWAN, T J The Treatment of Prostatic Hypertrophy by a New "Shrinkage" Method 239

CACIA, J R, and HARRIS, W A Study of the Comparative Effects of Various High Frequency Currents and of Thermal Cauterization in Prostatic Resection 239

232 ZEPHERINO DO AMARAL The Treatment of Varicocele by a New Surgical Method 239

232 HEPFGR, C C, and THIRIAUDAU, A A Teratoma of the Testis 240

## SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

Conditions of the Bones, Joints, Muscles, Tendons, Etc

233 PACLIANT, I The Behavior of Calcium in Bone After Total Exclusion of the Bile 222

233 FRASER, I Fragilitas Ossium Tarda 241

SANTI, E Osteomyelitis in the First Years of Life 241

GWYNNE, F J, and ROBB, D Calcareous Deposits in the Supraspinatus Tendon and the Subacromial Bursa 242

268 LUNARDI, B A Contribution to the Discussion of Exostosis Bursata of the Scapula 242

KISTLER, G H Sequences of Experimental Infarction of the Femur in Rabbits 243

234 CELLA, C An Anatomicofunctional Study of the Round Ligament of the Femur 243

WISBRUN, W The Plastic Supportive System of the Human Foot 244

Surgery of the Bones, Joints, Muscles, Tendons, Etc

LANGE, M Arthrodesis of the Posterior Inferior Ankle Joint—Talo-calcaneal Joint—in the Treatment of Severe Malformations of the Foot, Especially Flat Foot and Club-Foot 244

Fractures and Dislocations

235 WILKMAN, L A Multiple Spontaneous Idiopathic Symmetrical Fractures 245

235 MOORE, J J, and DE LORIMER, A The Calcium Stream and the Healing of Fractures 245

236 DODD, H Gangrene Following Fractures (Excluding Gas Gangrene) 246

236 CANAVERO, M An Unusual Luxation of the First Metacarpal 246

237 HENRY, A K., and BAXUMI, M Fracture of the Femur with Luxation of the Ipsilateral Hip 246

237 DARRACH, W, and STRIMON, B B Displacements in Fractures of the Neck of the Femur 247

## SURGERY OF BLOOD AND LYMPH SYSTEMS

Blood Vessels

237 COTTE, G, and MATHIEU, J Cases of Spontaneous Phlebitis Occurring During the Course of Development of Uterine Myomata 225

238 DUCUTING, J, and GUILHEM, P Obstetrical Phlebitis of the Subacute Venous Septicemia Type 233

- JACKSON, R. H. On the Early Development of the Vascular System. The Development of Blood and Blood Vessels in the Chorion of Man 448
- COLLIER, F. A. and MADDOCK, W. G. The Function of Periphrasal Vasoconstriction 448
- FAYEN, H. H. The Treatment of Varicocides. Preliminary High Ligation of the Internal Spermatic Vein with the Injection of Sclerosing Solutions 448
- STEWART, R. H., FREEMAN, N. E. and WHITE, J. C. The Effect of Epithelium on the Sympathetic Human "Enteroenteric" As Additional Cause of Failure of Operations for Raynaud's Disease 449
- Blood Transfusion**
- RANDOLPH, F. The Behavior of the Lactic Acid of the Blood in Suprarenal Insufficiency 45
- JACOBSON, B. and SCHROEDER, G. The Treatment of Werthoff's Disease with "Scroplacentol" Series of the Umbilical Cord 45
- COMET, The Treatment of Hemophilia with O. T. 45
- Lymph Glands and Lymphatic Vessels**
- ZAKUTSKY, A. A. Roentgenological Method of Examination of the Lymphatic System in Man and Animals 451
- KRYMCHAK, E. B. Is Typical Hodgkin's Disease an Infection or Neoplasm? 451
- CHAVEZ, L. F. Five-Year Survival in Hodgkin's Disease 451
- LEUCUTA, T. Irradiation in Lymphosarcoma, Hodgkin's Disease, and Leukemia 452
- SURGICAL TECHNIQUE**
- Operative Surgery and Technique; Postoperative Treatment**
- MYERS, C. Sculping and Its Treatment by Transplantation 454
- MURPHY, W. Postoperative States of Excitement 45
- Antiseptic Surgery; Treatment of Wounds and Infections**
- DE KROON, S. Treatment of Wounds by the Local Application of Whale Oil 45
- ROSPETTO, E. Experimental Researches on the Action of the Ultraviolet Rays in the Healing by Primary or Secondary Union of Wounds of the Skin, Muscle, and Parenchymatous Organs—Liver and Spleen 45
- SCHAFER, C. Posttraumatic Osteitis 456
- FEDOROVICH, D. Treatment of Pyogenic Surgical Diseases with Artificial Gastric Juice 457
- RITTER, C. The Significance of Bacteria in Surgical Infections 457
- FLORY, H. W., HARRIS, H. E. and FIELDS, F. The Treatment of Tetanus 457
- BART, L. Anti-Tetanus Vaccination 458
- SCHAFER, H. The Prophylaxis of Tetanus and Serum Sickness 458
- BUNELLO, A. I. Serum Shock and Serum Sickness Following Tetanus Vaccination and Its Treatment 458
- Anesthesia**
- CRADOCK, H. P. Factors Other Than Anesthetic Affecting Anesthesia 459
- SAGE, L. P. The Technique of Intratracheal Anesthesia 459
- BARTON, D. W., FINE, D. L., and HODGSON, A. C. Avertin in Pre-Anesthetic Medication. A Survey of 337 Surgical Anesthetics 459
- Surgical Instruments and Apparatus**
- COCHRAN, W. A. A New Physiological Suture Material 461
- PHYSICO-CHEMICAL METHODS IN SURGERY**
- Radiography**
- COOPER, G. M., KATZ, M. S. and MYERS, D. Roentgen Changes in the Petrous Portion of the Temporal Bone Without Clinical Manifestations 461
- T. YOUNG, H. K., and NATHANSON, L. A. Roentgenological Study of Tuberculosis of the Larynx and Neck 461
- LEHR, A., COMAR, C. G. and STOUT, A. P. Roentgen Therapy of Epitheliomas of the Pharynx and Larynx 461
- WALTER, A. E. Esophagography in Children 462
- DALE AGOSTA, V. and VALENTINI, R. The Roentgen Appearance of the Normal Mucosa of the Colon 462
- ZOLOTOVSKY, A. A. Roentgenological Method of Examination of the Lymphatic System in Man and Animals 462
- LEUCUTA, T. Irradiation in Lymphosarcoma, Hodgkin's Disease, and Leukemia (A Statistical Analysis) 462
- COTLER, M. The Problem of Radioresensitivity 462
- BRANDSTETTER, U. Roentgen Therapy of Gynecological Inflammations 463
- DRYJANSKY, A. U. A Classification of Tumors from the Standpoint of Radioresistivity 463
- McINTOSH, H. C. Changes in the Lungs and Pleura Following Roentgen Treatment of Cancer of the Breast by the Prolonged Fractional Method 464
- Radium**
- BOWERS, H. H. and FRICKER, R. E. Primary Racial Carcinoma under Radium Treatment. A Statistical Review of 500 Cases 466
- TARDON, F. J. Dose Lymphadenectomy with Irradiation in the Treatment of Cancer of the Cervix 467
- BOURGER, H. G. Uterine Carcinoma Following Radium Implantation into the Cervix 467
- FISHER, F. B., VICTOR, J., STEINMAN, N. and MacDonald, D. The Action of Radium on Tissue Calcifications 464
- McCoy, H. A. Necrosis Following Radium Treatment. A Preliminary Report 465

## Miscellaneous

- REPETTO, L. Experimental Researches on the Action of the Ultraviolet Rays in the Healing by Primary or Secondary Union of Wounds of the Skin, Muscles, and Parenchymatous Organs—Liver and Spleen 256

## MISCELLANEOUS

## Clinical Entities—General Physiological Conditions

- SYMMERS, D. Status Lymphaticus 266  
 CRITCHLEY, M. Some Aspects of Pain 266  
 BLALOCK, A. Shock. Further Studies with Particular Reference to the Effects of Hemorrhage 267  
 DÉVÉ, F. Intermediate and Transitional Pathological Forms Between Hydatid Echinococcus and Alveolar Echinococcus (Bavaro Tyrolienne) in Man 267  
 WALLGREN, A. The Value of Calmette Vaccination in the Prevention of Tuberculosis in Childhood 268

- DONNALLY, H. H., and NICHOLSON, M. M. A Study of Vaccination in 500 Newborn Infants 268  
 FRANKLIN, G. E., and VASTINE, J. H. The Treatment of Epithelioma of the Skin 268  
 BUCALOSI, P. A Histological and Critical Study of Myxomata and Myxomatoid Tumors 269  
 LUMSDEN, T., MACRAE, T. F., and SKIFFER, E. The Direct Demonstration of Anti Cancer Bodies in the Serum of Animals Immune to a Homologous Tumor 269  
 GAMBOLLO, A. Roffio's Test in Cancer. Statistical Results of 11,000 Cases 270  
 ENDERLEN. Indications for Early Operations 270  
 GOYANES, J. Air and Fat Emboli and Their Surgical Importance 271

## Surgical Pathology and Diagnosis

- GABRIELLI, S. The Takata Ara Reaction in Surgical Conditions 272

## BIBLIOGRAPHY

## Surgery of the Head and Neck

Head  
Eye  
Ear  
Nose and Sinuses  
Mouth  
Pharynx  
Neck

## Surgery of the Nervous System

Brain and Its Coverings; Cranial Nerves  
Spinal Cord and Its Coverings  
Peripheral Nerves  
Sympathetic Nerves

## Surgery of the Chest

Chest Wall and Breast  
Trachea, Lungs, and Pleura  
Heart and Pericardium  
Esophagus and Mediastinum  
Miscellaneous

## Surgery of the Abdomen

Abdominal Wall and Peritoneum  
Gastro-Intestinal Tract  
Liver Gall Bladder Pancreas, and Spleen  
Miscellaneous

## Gynecology

Uterus  
Adnexal and Peritoneal Conditions  
External Genitals  
Miscellaneous

## Obstetrics

Pregnancy and Its Complications  
Labor and Its Complications  
Puerperium and Its Complications  
Newborn  
Miscellaneous

## Genito-Urinary Surgery

273 Adrenal, Kidney and Ureter  
273 Bladder, Urethra, and Penis  
274 Genital Organs  
274 Miscellaneous  
275

274  
275  
275  
276

Surgery of the Bones, Joints, Muscles, Tendons  
Conditions of the Bones, Joints, Muscles, Tendons,  
Etc.

276 Surgery of the Bones, Joints, Muscles, Tendons, Etc.  
276 Fractures and Dislocations  
277 Orthopedics in General  
277

275  
276  
276  
277

## Surgery of the Blood and Lymph Systems

277 Blood Vessels  
277 Blood, Transfusion  
278 Lymph Glands and Lymphatic Vessels  
278

277  
277  
278  
278

## Surgical Technique

Operative Surgery and Technique; Postoperative  
Treatment  
278 Antiseptic Surgery; Treatment of Wounds and  
278 Infections  
280 Anesthetics  
63 Surgical Instruments and Apparatus  
284

273  
283  
284  
284

## Physicochemical Methods in Surgery

281 Roentgenology  
282 Radiant  
283 Miscellaneous  
283

284  
285  
285

## Miscellaneous

284 Clinical Entomology—General Physiological Conditions  
285 General Bacterial, Protozoan, and Parasitic Infection  
286  
286 Ductless Glands  
286 Surgical Pathology and Diagnosis  
286

285  
286  
286

# INTERNATIONAL ABSTRACT OF SURGERY

MARCH, 1935

## ABSTRACTS OF CURRENT LITERATURE SURGERY OF THE HEAD AND NECK

### HEAD

Connors, J F, and Wright, L T Fractures of the Skull *Ann Surg*, 1934, 100 996

The authors report their experience in the treatment of 1,760 cases of cranial and intracranial injuries. They divide the cases into 3 groups. The first group, consisting of 497 cases, was treated in the period from 1914 to 1924, a so-called operative period, with a mortality of 52.1 per cent. The second group, consisting of 336 cases, was treated in the period from 1925 to 1927, a period of conservative treatment, with a mortality of 45 per cent. The third group, consisting of 927 cases, was treated conservatively in the period from 1930 to 1934, with a mortality of 21.7 per cent. The authors' routine diagnostic procedure includes

- 1 Careful elicitation of the history if this is possible

- 2 X-ray examination at the time the patient is admitted to the hospital unless he is in shock.

- 3 In the cases of all unconscious or seriously injured patients, an immediate examination by a member of the visiting staff, day or night

- 4 An immediate lumbar puncture and a cell count of the spinal fluid

- 5 A lumbar puncture and cell count of the spinal fluid from eight to twenty four hours after the initial tap

- 6 Study of the patient for the development of presumptive signs and symptoms

- 7 Determination of the pressure of the cerebrospinal fluid (The authors state that while they do not consider this of much diagnostic importance, primary hypotension of the cerebrospinal fluid makes the prognosis grave in cases of proved injury)

- 8 A white blood cell count, urinalysis, and Wassermann tests of the blood and spinal fluid and, in the cases of unconscious patients, a complete chemical study of the blood with particular attention to the blood sugar

- 9 A careful examination for associated injuries

- 10 Neurological and ophthalmological examinations

The authors advocate the usual methods of conservative treatment, emphasizing the importance of (1) giving the brain a chance to stabilize itself before more hemorrhage is produced, (2) maintaining the fluid balance, (3) maintaining nourishment and preventing starvation acidosis, and (4) preventing pneumonia and meningitis.

They conclude that the treatment of intracranial pressure in cases of acute craniocerebral trauma by subtemporal decompression operations, intravenous injections of hypertonic glucose solutions, and lumbar drainage earlier than six or seven days after the injury is unwise and should be abandoned. They believe that in an occasional case of high intracranial pressure the delayed intravenous administration of hypertonic solutions of glucose with delayed lumbar drainage may be beneficial when the active bleeding has stopped and is not likely to recur as a result of the reduction of the intracranial pressure.

ROBERT ZOLLINGER, M.D.

Dill, J L, and Crowe, S J Thrombosis of the Sigmoid or Lateral Sinus A Report of Thirty Cases *Arch Surg*, 1934, 29 705

During the past twenty years only 30 cases of otic sinus thrombosis have been treated at the Johns Hopkins Hospital although an average of 15,000 patients with diseases of the nose, throat, and ear are seen each year in the out-patient department. An analysis of the symptoms and end-results in this group shows clearly that each patient must be studied individually and that no dogmatic rules for either diagnosis or treatment are justifiable.

Of the 30 patients, 16 were children under fourteen years of age. One patient was one year and another sixty-four years old. The syndrome of chills, a septic temperature, and a positive blood culture are often absent. It was present in only 6 (20 per cent) of the cases reviewed. As a rule the blood count is higher in children than in adults. In 1 of the



reviewed cases white-cell count of 5,800 was associated with a temperature of 106 degrees F in another count of 8,700 with a temperature of 104.8 degrees F a positive blood culture, and meningitis and in a third, that of a woman forty-six years of age who recovered, a count of 9,800 with a temperature of 105 degrees F and 40 colonies of hemolytic streptococci in the blood culture. The hemolytic streptococcus, the organism most commonly present in the blood in cases of otitic thrombosis, was found in 50 per cent of the series. A culture from the mastoid or middle ear may give no indication of the organism in the blood stream because the staphylococcus or other organisms frequently present in this location overgrow and prevent recognition of the hemolytic streptococcus. In uncomplicated cases the general direction of the temperature curve following operation is toward normal. The most common causes of a continued septic temperature are secondary abscess and pneumonia. In 4 of the cases reviewed transfusions were given. The authors believe that they are of decided value providing precautions are taken to prevent severe systemic reactions.

There were 10 deaths in the 50 cases reviewed, a mortality of 33 per cent. Of the 50 patients who recovered, 3 had pain, redness, and swelling around one or more of the joints, 3 had an isolated abscess of the muscles of the legs and had pneumonia.

In the Johns Hopkins Hospital the surgical treatment of sinus thrombosis varies with the severity of the clinical symptoms. A simple mastoidectomy is performed in all cases, but a radical operation on the mastoid is done only if the hearing is markedly impaired by extensive suppuration of the middle ear or cholesteatoma. If there is clinical evidence of septicemia, a portion of the lateral sigmoid sinus is exposed for direct inspection. As a rule, the sinus is opened, the clot removed, and the jugular vein ligated. If the absence of clinical evidence of septicemia it is believed advisable to establish drainage and wait rather than to make an exploratory incision or puncture of the sinus through an infected field.

HENRIET F. TAYLOR, M.D.

Krohn, C. The Treatment of Fractures of the Neck of the Mandible, Especially in Children, and the Results Obtained in a Few Cases (Die Behandlung von Fractura coli mandibulae besonders bei Kindern und die Resultate von einigen Fällen). *Deutsche Zahnärztliche Zeitschrift* 1934, 10.

Fractures of the jaw especially isolated fractures of the neck of the jaw are rare in children. Therefore the literature contains few reports on methods of treating them or the results of such fractures. The author discusses the causes, diagnosis, and therapy on the basis of four cases.

He states that fracture of the neck of the mandible is usually caused by an indirect force and may be associated with other fractures of the lower or upper jaw. In bilateral fractures there is a typical and nearly symmetrical backward and upward dis-

location and the chin portion is drawn down so that there is often a space of  $\frac{1}{2}$  cm. between the roots of teeth. Unilateral fracture of the neck is accompanied by a dislocation of the fragment toward the lowered side and a displacement backward, outward, and upward. A roentgen examination should always be made.

If the condyloid process is only dislocated, direct reduction is not essential. It is necessary only to replace the large fragment in correct relation to the upper jaw. The small fragment will usually return to its normal site. As a rule it is possible to obtain good healing with good joint function, good opening of the mouth, and good articulation. The immobilization of the lower jaw need never be complete. For temporary fixation to the upper jaw the author uses intermaxillary elastic bands which permit limited but sufficient opening of the mouth. The movements of the jaws in speech, in the taking of nourishment (fluids) and in the necessary cleaning of the mouth prevent articular disturbances and muscle atrophy and to a certain extent preserve the natural function of the lower jaw. Krohn disapproves of the American method of complete immobilization. He states that in the cases of small children extirpation of the condyloid process is contra indicated because it has severe, irremediable sequelae. In cases of subluxation fracture in adults, extirpation may have relatively good results.

The first of Krohn's four cases of fracture of the neck of the mandible as one of bilateral fracture in a boy 15 years old. Reposition was done with the use of intermaxillary elastic bands and the application of a splint to the teeth of the upper and lower jaw. The second case was one of unilateral fracture in a boy 10 years old and nine months old. The third was a case of unilateral fracture in a boy five and half years old. Because of the impossibility of obtaining sufficient dental fixation in this case extra-oral reposition and fixation were done. An excellent result was obtained. The fourth case was one of bilateral fracture which occurred when the patient was three years old but did not come for treatment until the patient was seven years old. In this case the fracture had resulted in ankylosis of both joints and micrognathia of the lower jaw.

The preparation and application of the different splints in combination with a plaster cast is shown by numerous illustrations. GUTHACK

Reichenbach, Z. Fracture Dislocations of the Neck of the Mandible (Die Verrenkungsfracturen des Unterkiefergelenks). *Deutsche Zahnärztliche Zeitschrift* 1934, 11.

By the term dislocation fracture is usually meant fracture in which the part of the fractured bone including the joint end has lost its normal position completely or incompletely (subluxation fracture). The author discusses dislocation fractures of the head of the mandible near or extending into the joint. The increase in the frequency of such fractures since the War has been due to the increase

# SURGERY OF THE HEAD AND NECK

## EYE

Schoenberg, M J Retinal Detachments Clinical Experiences with the Diathermic Treatment *Arch Ophth*, 1934, 12 708

in sport and transportation accidents and to the fact that such fractures are now recognized more often because of more frequent X-ray examination. In 1933, 24 per cent of the fractures of the jaw seen in the author's clinic were dislocation fractures and 25 per cent of the latter were articular fractures. In discussing the manner in which such fractures are produced, Reichenbach cites especially Wassmund's report on fractures and dislocations of the facial portion of the skull, published in 1927, but refers also to articles by Perthes, Borchers, Schlamp, and others. He states that it is difficult to explain why the head of the bone sometimes fractures in one way and sometimes in another. The direction of the line of fracture is not constant. Also in the discussion of this problem Reichenbach cites the author's mention. He says, "The syndrome of dislocation fractures of the joint head is produced by the recognized factors in all bone fractures." As one or another symptom may be lacking, a positive diagnosis can be made only by roentgen examination.

In the treatment, operative reduction or extirpation of the avulsed head has been done most frequently. Rundi, in an article on the clinical picture of articular fractures of the lower jaw published in 1928, was the first to call attention to the fact that non-operative treatment may be successful in dislocation fractures of the head of the jaw. He carried out such treatment with functional splints combined with a unilateral or bilateral movable splint or a rubber chewing prosthesis.

Independently of Rundi, Reichenbach has been trying non operative treatment in cases of dislocation fractures of the head of the jaw for several years. In all of his cases (twelve) the basic treatment was the same. The dislocated small fragment was left entirely alone, attention being directed only to the large fracture fragment. Intermaxillary elastic bands were introduced between splints in the upper and lower jaw to obtain semi-immobilization. The twelve cases are reported in detail. In all of the cases subsequent examinations demonstrated that the opening and closing movement was unhindered. In no case were there disturbances of articulation. Mastication was subjectively as good as before the injury. Anatomically, except in one case with normal healing, the dislocation persisted. Nevertheless bony healing occurred. Roentgen examination disclosed marked deformities of the joint and especially of the joint head. Neither roentgenologically nor clinically, however, was it possible to observe evidences of arthritis deformans. The author believes that because of the great risk of surgical treatment, orthopedic treatment is to be preferred only for old fractures in which attempts at reduction of the large fragment by strong apparatus has been unsuccessful. For such fractures he recommends one of the surgical procedures suggested by Perthes—osteotomy at the site of fracture, resection of the head of the jaw, or osteotomy above the angle of the jaw.

GERLACH

Of twenty-three cases of retinal detachment treated by diathermy, the treatment was successful in fourteen and failed in nine. The author analyzes the failures. He states that in several of the cases of failure the prognosis was poor because of long duration of the detachment with consequent degeneration of the retina and vitreous. In two cases of aphakia the periphery of the fundus could not be properly examined, and in others there was lack of cooperation after the operation. In one case in which the result was unsuccessful the patient vomited the night after the operation. However, early postoperative vomiting occurred also in several of the cases in which cure was obtained. In addition to poor selection of the cases for diathermy, errors in technique, and lack of postoperative cooperation there are other less obvious reasons for failures. The choroid may be so atrophic that it will not react to coagulation or to any other means of producing an inflammatory reaction. A degenerated and folded retina may not be capable of returning to the normal position, or the return of the retina to its normal position may be prevented by adherence to the vitreous. In some cases the subretinal fluid may not be resorbable. The cases discussed are reported in detail. In conclusion the author says that as most of the successful results were obtained in the last cases treated, it is obvious that experience making for a better technique is of importance.

WILLIAM A. MANN, JR., M D

## EAR

Coates, G M, Ersner, M S, and Myers, D Roentgen Changes in the Petrous Portion of the Temporal Bone Without Clinical Manifestations *Arch Otolaryngol*, 1934, 20 615

Following a review of the literature relative to involvement of the apex of the petrous portion of the temporal bone, the authors state that Gradenigo's syndrome may be independent of petrositis, petrositis may produce Gradenigo's syndrome, and petrositis may exist without symptoms. Gradenigo's syndrome has been attributed to venous congestion of the temporal bone resulting from venous circulatory disturbances.

In many instances the roentgenologist is unable to distinguish between petrositis, exudative petrositis, and congestion of the petrous portion of the temporal bone due to venous anomalies of the skull. According to Wittmaack, Profant, Druess, Koetzky, and others, true petrositis can occur only in a pneumatized temporal bone.

In a diploic temporal bone, the lesion is usually osteomyelitic rather than coalescent. Petrositis as revealed by roentgenography does not necessarily indicate surgical intervention.

The Kopetsky Altmour operation and other operations on the petrous portion of the temporal bone do not always come up for consideration, as many patients recover after simple mastoidectomy and myringotomy.

Key films are essential for: (1) determination of the type of temporal bone, whether it is pneumatic, sclerotic, or diploic; (2) determination of the size of the lateral sinus and jugular foramina; and (3) roentgenographic visualization of the temporal bone for a permanent record.

The authors report nine cases showing definite roentgenographic evidence of involvement of the apex of the petrous portion of the temporal bone. Recovery occurred in all. One patient recovered following a Kopetsky Altmour operation and another after several myringotomies. The authors state that judgment and care are necessary in deciding on the treatment in given cases. Radical surgical procedures should always be based on definite indications. JAMES C. BRAUNWELL, M.D.

### NOSE AND SINUSES

Spiegelberg, W. The Pathology of Chronic Sinusitis in Children. *Laryngoscope* 1934, 44, 385.

The author states that on rhinoscopic examination it is not at all difficult to determine the predominant lesion from the gross appearance of the nasal tissues. It tends toward either hypertrophy or atrophy. The mucosa of the nose and turbinates reflects the condition of the sinus mucosa. In both acute and chronic sinusitis there may be superimposed suppurative, vasomotor and allergic rhinitis are not included in the author's discussion. Spiegelberg says that he has never seen an allergic rhinitis with trophy of the nasal mucous membrane.

JAMES C. BRAUNWELL, M.D.

### PHARYNX

Hoover, W. B. The Treatment of the Lingual Tonsil and Lateral Pharyngeal Bands of Lymphoid Tissue. *Surg Clin North Am* 1934, 14, 57.

The author states that the lingual lymphoid tissue and lateral pharyngeal masses of lymphoid tissue are frequently the sites of recurrent follicular infection and may constitute foci of infection. They often cause local symptoms requiring treatment for relief, but are very frequently overlooked.

When they are the sites of recurrent follicular infection or may be foci of infection they should be removed. The author describes a practical method for their removal. JAMES C. BRAUNWELL, M.D.

### NECK

Kenn-Apelahiti, L. Studies on Myxodermas in Children (Studien ueber Myxoderm bei Kindern). *Acta Soc Med Fennica Duodecim* 1934, 9 Fasc.

The author reviews eighty-seven cases of infantile myxodermas, most of which he collected from the

records of the hospitals and other institutions in Finland. Two-thirds of the subjects were girls. The condition occurs throughout the country but is least frequent in the eastern portion. In seventy-five of the cases reviewed it was congenital. Familial hereditary conditions included tuberculosis in 21 per cent of the cases, hypothyroidism in 3 per cent, heart disease in 9.8 per cent, and goiter in 8 per cent. Many of the mothers gave a history of toxemia, kidney disease, hemorrhage, and nervousness. In only five instances were two children of the same family afflicted. The average weight of the myxodermatous children at birth was 4.05 kgm. as compared with an average weight of 3.500 kgm. for all Finnish children. The weight at birth of the myxodermatous children usually exceeded that of the other children in the family. The prognosis was poorer in the cases of the children who weighed most at birth. Thyroid deficiency may therefore cause intra-uterine metabolic disturbances.

The untreated children with myxodermas grew most quickly during the first months of the first year. Their growth then slowed down, with each succeeding year, and usually stopped between the fifth and sixth years. The mortality was high during the first two years (at least 7 per cent). Death usually resulted from pneumonia. Anemia was always present, and the secretory and motor functions of the stomach were diminished. Thyroid implantation was done in four cases, but had only transitory effect.

In the cases of eleven infants microscopic studies were made of skin specimens removed for biopsy before and after thyroid treatment. The development of the skin was retarded, and there was pronounced atrophy with almost complete disappearance of the sebaceous glands. Only traces of the hair roots were found, and the sweat glands were small and vacuolated. There was little or no fat about the sweat glands. The blood vessels were small and few. The corium showed compact, thickened mass of fibrous tissue. The epidermis was uniformly thickened, and the papillae were absent. The subcutaneous fat was atrophic or underdeveloped. After thyroid treatment for only three weeks new sebaceous glands and hair follicles appeared and there was general growth of the cells with development of the sweat glands, blood vessels, and fatty tissue. The corium became narrower and less compact. The effects of thyroid therapy are not equally favorable in all cases. LEO M. KERNERMAN, M.D.

Parkinson, J., and Hoyle, C. Thyrotoxic Hypertension. *Lancet* 1934, 17, 93.

Data from no cases of hypertension are presented in 4 tables. It is assumed that symptoms derived from increased nervousness indicate hyperthyroidism. No studies of the basal metabolism are reported. Subtotal thyroidectomy was done in 18 cases, but its effect on the blood pressure cannot be judged as yet. In the discussion there are frequent references to the literature. P. VI. STARR, M.D.

## SURGERY OF THE HEAD AND NECK

McClure, R. D. Thyroid Surgery as Affected by the Generalized Use of Iodized Salt in an Endemic Goiter Region, Preventive Surgery *Ann Surg.* 1934, 100 924

Iodized salt was first introduced to the public as a prophylactic measure against endemic goiter in Michigan in 1925. A progressive diminution in the incidence of goiter in children then began and has continued. In 1924, 35 per cent of Detroit children examined had goiter, whereas in 1932 the percentage was only 14. In 1927 there was a slight increase in the number of thyroidectomies performed in 7 Detroit hospitals, but since then a progressive decrease has occurred each year. In 1933, 591 thyroidectomies were performed as compared with 1,294 in 1926. In 1925, 1926, and 1927 the Detroit Board of Health reported a great increase in deaths due to goiter, but since 1930 the number of deaths from this cause has been no greater than in the years from 1916 to 1924. The findings of the author's investigation and his conclusions are summarized as follows:

- 1 Iodized salt as used in Michigan at first apparently increased the number of thyroid operations.
- 2 The increase was in cases of nodular goiter or adenomata. The iodized salt may have activated a group of quiescent adenomata, producing toxic goiter symptoms.
- 3 The increase reached its peak in the second year after the introduction of iodized salt.
- 4 An increase in the death rate from goiter as shown by the Board of Health Statistics reached its peak in the second year after the introduction of iodized salt.
- 5 There was no increase in hyperthyroidism except in cases of nodular goiter or adenomata.
- 6 The number of operations for toxic diffuse and toxic nodular goiter has rapidly and steadily decreased since the apex of the second year increase.
- 7 The incidence of endemic goiter or enlarged thyroid has been reduced to almost nil since iodized salt has been widely used.
- 8 No cases showing the slightest ill effects from the use of iodized salt are now seen.
- 9 Toxic nodular goiter and toxic diffuse goiter are less apt to occur when there has been no previous enlargement of the thyroid (endemic goiter).

PAUL STARR, M.D.

Mixter, C. G., Blumgart, H. L. and Berlin, D. D. Total Ablation of the Thyroid for Angina Pectoris and Congestive Heart Failure *Ann Surg.* 1934, 100 570

The authors report the results obtained in twenty-five cases of angina pectoris and fifty of congestive heart failure in which total thyroidectomy was done for relief of the symptoms. As experience in this treatment increased, the mortality decreased and the incidence of good results increased rapidly. The factors chiefly responsible for the decrease in the operative mortality were the substitution of local for general anesthesia, the reduction in the amount of pre operative and postoperative sedation, and

more careful selection of cases for the operation. The increased incidence of favorable results in the later cases was due almost entirely to the last factor.

In the cases of angina pectoris there was no operative mortality. Thirty-five per cent of the patients were completely relieved, 50 per cent showed moderate benefit, and only 15 per cent showed no improvement. Those showing no improvement were operated upon early in the course of the work and would not now be considered suitable for this type of therapy.

In the cases of congestive heart failure there was an operative mortality of 12 per cent. Fifty-five per cent of the patients who were formerly incapacitated and confined to bed a great part of the time are now working or able to work, 13 per cent show definite improvement, and 7 per cent show no improvement. Thirteen per cent who were moderately benefited for from four to ten months after the operation subsequently died of cardiac disease. The mortality of 12 per cent occurred in the first twenty-eight cases. As in the cases of angina pectoris, the unsatisfactory late results occurred in the patients who were operated upon in the early phase of the work.

The authors state that a permanent beneficial effect from the operation is not to be expected until the basal metabolic rate has fallen 20 per cent or more. A pre operative basal rate of -20 or below is a definite contra-indication to the operation. This was demonstrated by the fact that all patients required postoperative thyroid feeding to control myxedema when the basal rate reached approximately -30. In cases in which the pre-operative basal metabolic rate is low, thyroid feeding is required when the rate decreases from 5 to 10 per cent, and this small drop is not sufficient to relieve the symptoms. Operation is contra-indicated also in cases of congestive heart failure in which there is evidence of heart disease progressing rapidly in spite of all forms of medical therapy, cases of angina pectoris which have become progressively more severe over a relatively short period of time, and cases with a history of previous coronary thrombosis.

ARTHUR S. W. TUCKOFF, M.D.

Brenner, O., Donovan, H., and Murtagh, B. L. S. Total Thyroidectomy in the Treatment of Congestive Heart Failure *Brit M J.* 1934, 2 624

The authors report six cases in which complete thyroidectomy was done during the first four months of 1934 for the amelioration of terminal heart disease. In all of the cases the cardiac condition was improved as judged from tolerance to exercise shortly after the operation. None of the patients died as a result of the thyroidectomy. One died of a cerebral vascular accident. The venous pressure was not significantly altered. The pulmonary circulation time was either unchanged or increased. The vital capacity was unchanged. The basal metabolic rate was lowered 17 per cent. Only two of the six patients showed signs of slight hypothyroidism.

PAUL STARR, M.D.

Stone, H. B., Owings, J. C., and Gey, C. O.: Transplantation of Living Grafts of Thyroid and Parathyroid Glands. *Ann. Surg.* 93:4, 60-613.

In this article the authors report their further experience in attempts to transplant living thyroid and parathyroid tissue from one animal to another of the same species. From their earlier experience they conclude that in the site in which a prospective graft is to be placed there should be a closely adjacent vascular supply from which new vessels may develop to support the growing graft, but that the tissue itself should not contain a rich capillary network, as does the liver and spleen, because in such a bed the development of hematomata is apt to choke the graft. The tissue selected should be loose in texture and free from a dense capsule, such as that of parenchymatous organs, and from firm sheaths such as that of voluntary muscles which could cause pressure on the graft and inhibit its growth. The site selected should be easy of access in order that a difficult or hazardous operative exposure will not be necessary for the implantation and there will be no damage to any necessary or important organ. All of these requirements are met by the loose areolar tissues of the axilla and groin. Practically all of the authors' successful grafts, both in dogs and human beings, were placed in these localities.

The authors state also that exceedingly small grafts are much more apt to survive than large fragments of transplanted tissue because only the peripheral layer of cells in the graft can be nourished by the body fluids of the host before the graft becomes vascularized.

Another factor studied was the adjustment of the graft to the chemistry of its new environment in the host animal. In their attempts to adapt the graft to the host the authors first grew the tissues to be transplanted in an artificial tissue culture medium containing the body fluids of the future host. They describe the technique of their cross-grafting experiments as follows:

Under aseptic conditions a portion of gland is removed from Animal A. With precautions for rigid asepsis, which are maintained throughout the several weeks and all stages of the experiment, this portion of gland is cut up with special knives into fragments from 1 mm in diameter. The fragments are then implanted in culture medium contained in a hollow ground slide or small flask, and the culture is placed in a thermostat at body temperature. As it grows, the culture tends to liquefy the medium. When liquefaction occurs it must be transferred to fresh media. The rate of liquefaction varies with different cultures. Some parathyroid tissues require an almost daily transfer. Into some thyroid tissues will not require transference oftener than at intervals of three or four days. After being kept in culture in this way for a period of from two weeks to a month, the culture is ready for implantation as a graft. A hematoma is pushed bluntly into the fat and areolar tissue near the large vessels and spread so as to make a pocket to receive the graft. The various

small cultures to be implanted are picked up in a pipette, suspended in salt solution, and then squirted gently into the pocket prepared for them. The culture medium is composed of: (1) eight parts of physiological salt solution plus destroyer; (2) one part of beef embryo extract, and (3) three parts of the recipient serum and eight parts of fresh plasma of the recipient obtained from chilled heparinized blood. This formula makes up to a total of twenty parts.

Of the last series of eleven dogs in which the authors made homotransplants of thyroid and parathyroid glands, five showed definite unquestionable long standing takes. Histological examination of the grafts after varying periods of weeks disclosed very little evidence of an inflammatory reaction, but showed new ingrowth of blood vessels from the host and evidence of mitosis in the graft cells.

The authors have also used the described method of grafting in ten clinical cases. Grafting of thyroid and of parathyroid tissue was done in five cases each. In only two of these cases was the grafting done sufficiently long ago to warrant conclusions regarding the results. In both of these homotransplantation of tissue was done to correct post-thyroid deficiency resulting from surgical operation. In both, the symptoms of deficiency were relieved and the chemical character of the blood was restored to normal. *LARRY R. DUNSTON, M.D.*

Taylor, H. K., and Nathanson, L.: A Roentgenological Study of Tuberculous of the Larynx and Neck. *Am. J. Roentgenol.* 9:34, 21-539.

The authors state that laryngeal tuberculosis occurs often enough as a concomitant of the malignant type of pulmonary tuberculosis to warrant routine roentgen studies of the larynx in cases of tuberculosis of the lungs. They refer briefly to the studies of tuberculosis of the larynx and neck which have been made by others and discuss the pathological changes in the condition at some length. In describing their own technique of examination they emphasize the importance of a complete roentgenological study including observations during phonation, inspiration, expiration, and swallowing, with and without the use of barium, and, in addition, a lateral roentgenogram, one taken while the larynx is at rest and the other while the patient is making high pitched E sound. They describe the structures which may be visualized under normal and pathological conditions and show them as roentgenograms.

Tuberculous lesions of the larynx are classified by the authors into 3 groups—the minimal, the moderate, and the extensive. This classification is based on their extent rather than on anatomical or pathological factors. The minimal lesions are located in the ventricle or the lateral ventral area or both. The moderate lesions involve the arytenoid eminences and extend either (1) to the laryngeal folds above or the aryepiglottic folds below. They may also involve adjacent soft tissues. The extensive lesions affect practically all of the laryngeal structures and

may also involve the contiguous tissues. Involvement of the epiglottis is particularly pronounced in this group. The changes demonstrable roentgenologically in each of these groups are discussed at length.

Correlation of the roentgenological with the clinical manifestations in 100 cases studied revealed a slight discrepancy, especially in cases of minimal lesions. A few minimal lesions were missed on roentgen study and 1 lesion which had been missed on physical examination was discovered on roentgen examination. In the cases of moderate and extensive lesions there was little difference in the findings except for slight variations in the pathological details. Pulmonary tuberculosis of the caseous pneumonia type was present in 93 of the 100 cases, pulmonary tuberculosis of the exudative productive type in 5, and pulmonary tuberculosis of the proliferative type in 1. In 1 case the chest was negative.

With regard to the differential diagnosis the authors state that roentgen examination of the neck will not always permit an absolute differentiation between laryngeal tuberculosis, syphilis, benign and malignant neoplasms, and paralysis of the vocal cords. They describe briefly the changes which are more or less characteristic of these conditions. They state that unless the lesion seen in the larynx is very characteristic of a condition other than tuberculosis the presence of pulmonary tuberculosis is usually very good evidence that the pathological involvement of the larynx is tuberculous. In many instances the site of involvement and the gross pathological changes visualized in the roentgenogram suggest the diagnosis.

In summarizing their article the authors state that roentgen study is an aid in the diagnosis of laryngeal tuberculosis and should supplement the laryngologist's examination. It presents a sagittal view from which the height and width of the lesion and the presence of subglottic extension can be determined. While small lesions situated deep in the interarytenoid area are not detected by roentgenography, small intraventricular lesions which may be missed on examination with the mirror are demonstrable in the roentgenogram. Moreover, roentgen examination gives a permanent pictorial record of the location, extent, and progress of the lesion.

ADOLPH HARTUNG, M D

Lenz, M., Coakley, C. G., and Stout, A. P. Roentgen Therapy of Epitheliomata of the Pharynx and Larynx. *Am J Roentgenol*, 1934, 32: 500.

During 1931 and 1932 the authors treated thirty-one verified epithelioma of the pharynx and larynx by a modification of the Coutard method of roentgen therapy. They give a detailed description of this method including the technical factors, the dosage, and the manner in which the treatments are administered. Only twenty-four of their cases were considered suitable for evaluation of the method and for the determination of the criteria prognosticating its success or failure. In four of the others

the dosage was insufficient, and in three a laryngectomy had been performed previously and there was doubt as to the persistence of the growth.

The twenty-four cases reviewed are tabulated with regard to the patient's age, the approximate size and site of the lesion, the surface dose and neck fields, and the period of treatment. The lesions were classified according to their microscopic appearance into three groups: radiosensitive, radioresistant, and doubtful, i.e., mixed. The characteristics which suggested radiosensitivity were infrequency or absence of keratinization (epithelial pearls, intercellular and intracellular deposits), scarcity or absence of intercellular bridges, marked variation in the size and staining quality of the cells and nuclei, numerous mitotic figures, and a minimal inflammatory reaction. Radioresistance was suggested by the opposite microscopic picture. A neoplasm was classified as doubtful when the radiosensitive and radioresistant characteristics were equally represented.

In eleven of the twenty-four cases there has been no clinical evidence of epithelioma during the nine months to two years since the last treatment. In thirteen the roentgen therapy failed to arrest the disease.

The total dosage administered per patient ranged from 5,600 to 9,400 r/o in the arrested cases and from 7,500 to 13,000 r/o in the unarrested cases. In the latter group the larger dosage and longer time of treatment were due to the fact that the disease was more extensive and therefore a greater number of fields of irradiation was required.

Of the eleven clinically arrested cases, 9 belonged to the radiosensitive and two to the mixed group. Of the cases in which the treatment was unsuccessful, ten were classed as radioresistant and three as radiosensitive.

Necrosis of the laryngeal cartilage is much less frequent after fractionated roentgen therapy than after the older vigorous roentgen therapy given in a short time, but occurs occasionally. The authors cite several instances in which it occurred in the series of cases reviewed.

Tracheotomy did not interfere with the treatment of the cases, whether it was done before or after the roentgen therapy.

According to the authors, this study confirms the experience of others which indicates that among the factors militating against successful treatment are (1) an extensive infiltrative growth, especially one associated with deep infection, and (2) tumor invasion or local nutritional changes of the laryngeal cartilages, processes which reduce the radioresistance of cartilage and favor chondronecrosis.

In conclusion the authors say that the results reported are very early and may change with time. However, they regard them as sufficiently encouraging to warrant continuation of the described method of roentgen irradiation in the treatment of epitheliomata of the pharynx and larynx.

ADOLPH HARTUNG, M D

MacKenty, J. E.: Malignant Diseases of the Larynx: Rare Types, Premalignant Conditions, and Conditions Simulating Malignancy. *Arch Otolaryngol* 934, 30 297

The author believes that benign lesions of the larynx rarely become malignant, and that malignant lesions which at first appear benign are malignant from the beginning, but for some biological reason their growth is kept in check for an indefinite period of time. He states that, contrary to the generally accepted theory, cancer of the larynx may occur in young persons. He has seen it in five patients under thirty years of age. Four of these patients were women. Three who were operated upon were free from recurrences for four, three, and one year respectively. Laryngeal carcinoma in the young is more common in women than in men, whereas laryngeal carcinomas occurring in later life is more common in men than in women. In young persons cancer of the larynx is apt to be mistaken for an infectious granuloma or a benign neoplasm. If laryngeal tuberculosis can be excluded, biopsy should not be delayed when laryngeal carcinoma is suspected. Biopsy should not be done in cases of laryngeal tuberculosis.

Sarcoma of the larynx is rare. MacKenty has observed only one case. The lesion resembles a slowly progressive chondritis with upward displacement of the lateralaryngeal structures without marring or changing of the surface. The characteristic appearance of a malignant growth is not seen in sarcoma until the lesion breaks through the mucous membrane.

In two of the author's cases of laryngeal cancer the condition followed prolapse of Morgagni's ventricle. Both of the patients gave a history of syphilis

and were engaged in an occupation demanding excessive use of the voice. MacKenty reports also a case of chondritis of the thyroid cartilage which resulted in cancer and a case of laryngeal sarcoma in a man sixty-three years old.

Scleroma of the larynx is the result of infection with specific micro-organisms, the Friesch bacilli. The lesions are discrete, bluish-red, ordinaris nodules which are infectious granulomata. They coalesce in large masses and when subjected to trauma may ulcerate. They may suggest sarcoma. Scarring and atrophy may occur. These lesions are more common in females than in males. They begin in the anterior part of the nasal septum and spread downward. In the larynx they resemble an atypical malignant condition so closely that correct diagnosis is rendered possible only by the nasal manifestations and biopsy. The treatment indicated is roentgen irradiation.

Amyloid tumors of the larynx may occur as a local lesion or as part of a generalized amyloidosis. The author has observed one case. The neoplasms are attributed by some to an overproduction of chondritis-sulphuric acid which becomes bound with proteins *in situ* and is most prone to occur in tissues subjected to inflammatory or neoplastic irritation. Multiple or single nodules appear. They are generally sessile, but sometimes pedunculated. They may be round or oval, and vary yellowish gray or reddish. There are no ulcerations. The treatment includes extirpation, fulguration and the application of radium.

Blastomycosis of the larynx, which is rare in America, is apt to be mistaken for tuberculous. Pemphigides of the larynx is also rare.

ALTON OGDEN, M.D.

# SURGERY OF THE NERVOUS SYSTEM

## BRAIN AND ITS COVERINGS, CRANIAL NERVES

Walker, A. E. Encephalography in Children  
*Am J Roentgenol*, 1934, 32 437

Children presenting neurological signs or symptoms referable to chronic or stationary lesions of the brain comprise a large group in which encephalography frequently yields valuable information. This diagnostic aid is particularly important because many clinical syndromes of childhood have varied changes in the brain as a pathological basis.

The encephalographic findings in some of these clinical syndromes of childhood are as follows:

1. Agenesis Cerebral agenesis may occur in any part of the brain, including the cerebellum. In this condition the encephalogram shows collections of air in various parts of the brain and cerebellum, depending upon the local agenesis present.

2. Birth injuries Birth injuries may be manifested by arachnoiditis, ventricular dilatations, or porencephalic cysts.

3. Late infantile palsies Infantile palsies due to acute cerebral insults in the first year of life are usually hemiplegias. The encephalograms in cases of such palsies show quite constant lesions either in the form of a dilated ventricle on the side opposite the paralysis, arachnoiditis, or an area of cortical atrophy on that side.

4. Microcephalus The findings in three cases were practically identical. All showed a marked internal hydrocephalus with evidence of severe aplasia of the frontal or parietal lobes.

5. Mongolian idiocy Only one case of mongolian idiocy has been reported. The findings in this condition consist of ventricular dilatation and marked aplasia of the frontal lobe.

6. Epilepsy The encephalographic findings in epilepsy in children, as in epilepsy in adults, present no constant features.

7. Acute inflammatory diseases of the central nervous system (encephalitis, meningitis) Encephalography in acute inflammatory diseases of the central nervous system in children has been found of no diagnostic value.

8. Degenerative diseases In degenerative diseases of the central nervous system encephalography often reveals the site of the most marked pathological process.

a. The Bielschowsky-Jansky type of amaurotic idiocy The findings in this condition consist of a greater increase of air in the sulci and over the cortex of the anterior portions of both hemispheres. Mild dilatation of the lateral ventricles and air collections about the cerebellum indicate marked atrophy of that organ.

b. Basal ganglion disease The findings consist of a considerable amount of air in the sulci over the cortex of the brain and an enlargement of the anterior horns of both ventricles due to the diminution of the shadow caused by the caudate nuclei.

9. Cerebral trauma Although children are subjected to cerebral trauma much more often than adults, it is relatively infrequent that serious sequelae are seen in the young. The minor after-effects often present in adults—the so-called post-traumatic syndromes of headache, dizziness, visual disturbances, and inability to concentrate—are practically never complained of by children under the age of ten years. Occasionally, however, they occur in children between the ages of ten and fifteen years. The roentgenographic findings are not constant.

DAVID JOHN IMPASTATO, M.D.

Cairns, H., Donald, C., Scott, S., Ormerod, F. C., and Others. Discussion on the Diagnosis and Treatment of Abscess of the Brain. *Proc Roy Soc Med*, Lond, 1934, 27 1643

CAIRNS and DONALD stated that abscesses of long duration usually have walls 0.5 cm or more thick. In cases of such abscesses they have obtained successful results only from complete removal of the abscess with its wall. In general there are two methods of dealing with brain abscesses: drainage by the closed method and drainage by the open method. In the former, the abscess is located by needling through a burr hole about 1.5 cm in diameter. Its depth is carefully noted, the bony opening enlarged to 2 or 2.5 cm in diameter, the dura opened more widely, and a Jacques rubber catheter (Size 10) or a webbed intratracheal catheter pushed into the brain to the desired depth in the same direction as the needle. If pus is located, the catheter is cut off about 2 cm above the surface of the brain and a dressing is built up about it. The whole head is then encased in a starch dressing to keep the catheter from moving.

By the open method drainage may be established through a limited opening (4 or 5 cm in diameter) or through a large opening made by turning down an osteoplastic bone flap. In cases of thick-walled abscesses the latter is more satisfactory.

Whatever method is used, the after-treatment is the same. The patient should be placed so that drainage of the abscess is favored by gravity. Dressings should be changed infrequently and the first dressing should be left undisturbed as long as possible, usually from seven to ten days. Earlier changing of the first dressing should be done only when some complication ensues or the patient becomes uncomfortable because of the discharge.

The postoperative complications include a rise in the temperature, cedema, meningitis, squint, double



## INTERNATIONAL ABSTRACT OF SURGERY

vision, incomplete drainage, recurrence and epilepsy. Edema and meningitis both probably play a part in the recurrence of the symptoms that occasionally follow temporary improvement after operation. From their observations Cairns and Donald have come to the conclusion that there is an active circulation of fluid in the white matter around brain abscesses. Under certain circumstances this may pass rapidly into the abscess cavity while under other circumstances, as in postoperative edema, it may accumulate in large amounts in the white matter. It is possible that postoperative edema may be caused wholly or partly by the spread of infection in the meninges and brain itself at the time the abscess is drained. Spreading meningitis can exist without any of the classical signs of meningitis. Cairns and Donald believe that a certain amount of meningitis always occurs after the drainage of an abscess and state that whatever the cause of the edema, it should not be treated by further surgery.

Incomplete drainage and recurrence may be due to the fact that the abscess is multilocular or that it has already burst through its wall into the surrounding tissue. The cases in which recurrence of the abscess is most to be feared are those in which neurological signs persist. Failure of recovery to occur probably indicates some tissue, and where there is some tissue there are likely to be areas of pus cells.

In some cases the chances for successful result from surgical treatment are extremely poor from the beginning because of the severity of the infection and the low resistance of the patient, but there are many cases in which death is due not so much to the inability of the patient to localize and limit the infection as to the surgeon's inability to find and deal adequately with the abscess.

Scott said that temporoparietal abscess, like cerebellar abscess of otitic origin, is due to infection penetrating directly through the bony wall and dura mater to the adjacent part of the brain and dura. It is justifiable to explore only when the signs and symptoms are fairly manifest. These may be divided into two groups—the cerebral and the cerebellar. Two types of treatment, craniectomy and drainage are tried for because of this nature.

In operations for brain abscess secondary to middle ear disease the first step includes exploration of the mastoid and the performance of Schaeffer's operation. Exposure and opening of the dura follow with drainage of the abscess if it can be located. Osborn expressed the opinion that the trauma of opening the often very hard bone with a mallet and gouge is apt to injure, by kind of contrecoup, the so-called capsule of the abscess which is very friable. Decompression by trephine is not so likely to injure the capsule.

HARRISON stated that he regarded it advisable sometimes to use the finger as a probe.

RALEIGH stated that the best method of treating otitic abscesses is the treatment for brain abscesses in general.

JOHN W. BARNES, F.R.C.S. (Ed.)

Belado, M., and Pardo, R.: Surgical Treatment of Hypophyseal and Perihypophyseal Tumors (Tratamiento quirúrgico de los tumores hipofisarios y perihipofisarios). *Arch. argent. de neur.* 1934, 1.

Following a discussion of the pathological characteristics, visual symptoms, and roentgen signs of hypophyseal and perihypophyseal tumors, the authors describe their technique and report their experience and results in the surgical treatment of such tumors. The conditions they treated included hypophyseal tumors, meningiomas, gliomas of the optic nerve, craniopharyngiomas, and ventriculohypophyseal diverticula and fistulae. The cases are reported in detail with illustrations. M. E. MOSES, M.D.

Fraser, C. H.: Bilateral Trigeminal Neuralgia. *A. S. Surg.* 1934, no. 770.

In the 193 cases of major trigeminal neuralgia admitted to the Neurological Clinic of the Hospital of the University of Pennsylvania 873 operations on the sensory root or ganglion have been performed. In 175 major trigeminal neuralgia is even distally a unilateral disease, there were 3 bilateral cases of bilateral involvement. The incidence of

Cushing reports the incidence of bilateral involvement as 5 per cent, and Adams, as 3 per cent. In 1916, Harris reported an incidence of 5 per cent in a series of cases which included "typical chronic trigeminal neuralgia major" in patients suffering with some form of chronic apoplectic paralytic, disseminated sclerosis, and in patients suffering with disseminated sclerosis. Harris says that cases of neuralgia in association with trigeminal any theory of chance. Fraser is unable to recall an case in which both conditions were present.

In the dolomereous unassociated with organic disorder, whereas in the dolomereous associated with disseminated sclerosis, especially when the neuralgia is bilateral, the neuralgia must be considered of central origin. The two neuralgias of radically different cases cannot easily be included in the same category.

In occasional cases involvement of the sensory root of the face occurs simultaneously. As a rule, however, neuralgia of the other side does not develop until after an interval, and in some cases the interval may be many years. As a rule also, the involvement is less severe on the second side than on the side primarily involved. The author reports a case with alternation of the pain, which is very rare.

With regard to the cause of the condition, no more is known today than was known two hundred years ago. Because of the paroxysmal type of the condition, no evidence of structural damage can be found in the trigeminal system, (it seems possible that the pain may be due to vasospasm).

In cases of bilateral involvement radical operation on the second side is not always indicated. Because of the comparative mildness of the recurrence and

the fact that it is usually confined to a single division, alcohol injections are often sufficient. Of the 23 cases of bilateral involvement reviewed, a bilateral major operation was performed in only 5. In 9 cases, operation was performed on one side and alcohol injections were made on the other, in 6 cases, operation was done on one side and the pain on the other side did not require treatment, and in 3 cases, alcohol injections were made on both sides. Since the development of the operative technique which avoids section of the motor root, the radical operation on the sensory root can be done safely without corneal complications or loss of function of the muscles of mastication. The mortality in the cases reviewed was 0.8 per cent.

In conclusion the author says that the choice of treatment should be left to the patient.

EDWARD S. PLATT, M.D.

### SPINAL CORD AND ITS COVERINGS

Peet, M. M., and Echols, D. H. Herniation of the Nucleus Pulposus. A Cause of Compression of the Spinal Cord. *Arch. Neurol. & Psychiat.*, 1934, 32: 924.

At its circumference, each intervertebral disk is composed of laminae of dense fibrocartilage forming the annulus fibrosus. The fibers run obliquely from one vertebra to the next and are firmly attached to the vertebræ. The nucleus pulposus, an incompressible, semi-gelatinous mass, is found near the center of the disk. Interposed between the disk and the adjacent vertebræ are thin plates of hyaline cartilage. Histologically, the nucleus is composed of loose fibrous tissue, a few cartilage cells, remnants of the notochord (large multinuclear cells), and a gelatinous matrix. Confined to its position by the elastic annulus fibrosus and the 2 cartilage plates, the nucleus pulposus acts as a shock absorber and a hydrodynamic ball bearing for the spine.

Local degeneration or trauma of the intervertebral disk may produce a minute fissure in the annulus fibrosus or in a cartilage plate. When this occurs, the nucleus pulposus, which is always under pressure, herniates through the defect. When the cartilage plate is fissured, the nuclear material forces its way into the cancellous bone of the vertebral body. The invading substance then undergoes proliferation and organization which finally transforms it into a firm nodule of cartilage, and a wall of dense bone is laid down about the lesion, making it visible in roentgenograms. The fissures which develop in the annulus fibrosus are usually situated posteriorly. Consequently, the prolapsing nuclear substance enters the spinal canal. There it forms a swelling under the posterior longitudinal ligament, usually to one side of the midline. There, also, secondary changes take place, transforming the herniated material into a firm nodule of cartilage which usually remains attached to the disk. In examinations of the spine in a series of 368 autopsies, Andrae found 56 cases of posterior nuclear extrusions ranging in size from that

of a hemp seed to that of a bean. All but one of them were too small to have produced compression of the spinal cord. These nodules may be found along the entire vertebral column and may produce signs of compression of the spinal cord at any level.

In the authors' first case the syndrome of involvement of the cauda equina was presented. Lateral roentgenograms showed narrowing of the disk from which the nucleus pulposus herniated. In addition, the degenerated vertebral body showed a rarefied area which indicated that a nuclear substance had also ruptured into it.

In conclusion the authors state that when a clinical diagnosis of compression of the spinal cord has been made and there is evidence of a diseased intervertebral disk at the proper level, retropulsion of the nucleus pulposus should be considered.

DAVID JOHN IMPASTATO, M.D.

Lehman, E. P. Uretero-Arachnoid (Ureterodural) Anastomosis. *Ann. Surg.*, 1934, 100: 887.

A brief review of the surgery of communicating hydrocephalus is followed by the report of two cases treated by uretero-arachnoid anastomosis and one case treated by ureterodural anastomosis.

The author emphasizes that the kidney pelvis must be anastomosed to arachnoid membrane if the patency of the anastomosis is to be maintained. He regards the suture of the pelvis to the dura as entirely incidental and of importance technically only for firm union.

One of his patients died of meningitis seventeen days after the operation, and another twenty-two days after the operation, apparently of acute dehydration. In the one case in which autopsy was done following a uretero-arachnoid anastomosis, the anastomosis was found patent, but apparently had not been functioning.

An adult patient who was not benefited by the formation of a left bone flap and subtemporal decompression showed improvement following a ureterodural anastomosis. Arachnoiditis was apparently responsible for the increased intracranial pressure. The author believes that the ureterodural anastomosis permitted drainage until new channels were formed and compensation in the circulation and absorption of the spinal fluid were acquired. Laboratory tests in late follow up studies indicated that the anastomosis was not functioning.

ROBERT ZOLLINGER, M.D.

### SYMPATHETIC NERVES

Ciceri, C., and Gabrielli, S. Studies on the Variations of Alimentary Glycemia Induced by Alcoholic Injection of the Splanchnics. Attempts to Cure Diabetes Mellitus (Studi sulle variazioni della glicemia alimentare indotte dalla alcoolizzazione degli splancnici. Tentativi di cura del diabete mellito). *Arch. Ital. di chir.*, 1934, 38: 121.

This is a continuation of the report of the authors' researches regarding denervation of the adrenals in

diabetes and the variations in alimentary glycemia produced by splanchnic anesthetics (Abst. in *Int. Abst. Surg.* 1934, 50, 422, 453). The first experiments demonstrated that in some cases bilateral denervation of the adrenals has a favorable and lasting effect on the glycemic disturbances and increases the sensitivity to insulin. The results of anesthetizing the left splanchnic were so beneficial that the authors were encouraged to undertake a series of experimental and clinical researches on alcohol injection of both splanchnics. Such injections were given in the cases of four diabetics. In three, the immediate result was a reduction of the glycemia and glycosuria and increased sensitivity to insulin. The tests have now been repeated at intervals of several months and the procedure applied to five more subjects (one a renal diabetic). It has been learned that some of the results which appeared brilliant immediately after the treatment were not permanent.

The cases are discussed in detail. The periods of observation ranged from six to fourteen months. Apparently the patients were on a somewhat restricted but not scientifically calculated diet. They were not under control, and some of them disregarded the dietary prescriptions. Nevertheless the results were sufficiently definite to justify conclusions as to the value of the procedure in diabetes and to contribute information which may prove of aid in the solution of the problem of the hormone relationships in this disease.

They showed that inhibition of the secretion of the adrenal medulla has a distinctly unfavorable effect in renal diabetes. This is probably due to the influence of lousba and adrenals on the renal threshold for glucose, the former lowering and the latter raising it.

In diabetes mellitus the effects on glucose tolerance, glycemia, and glycosuria vary. In juvenile diabetic and a woman with a particularly high glycemia and glycosuria, whose disease was of seventeen years duration, there was subjective improvement with good utilization of alimentary glucose for five or six months. At the end of that time conditions became as before except that the sensitivity to insulin was greater. Evidently the influence exercised on the adrenals by alcohol block of the splanchnics is not effective in all forms of diabetes. Therefore it is not always indicated to compensate for the functional deficiency of one organ by producing a hypofunction of its antagonist. In the two remaining cases, in which the glycemia was moderate, there was considerable improvement in the subjective state, general health, and utilization of alimentary glucose during the entire period of observation (seven and eight months respectively). In one of the cases the foot had been amputated for diabetic gangrene, and in the other there was a chronic interstitial nephritis.

The authors draw the general conclusion that the method is beneficial particularly when the diabetes is associated with hypertensive circulatory dis-

turbances. Nevertheless, attention is called to the fact that in all of the cases reviewed inhibition of the secretion of the adrenal medulla provoked greater activity of the pancreatic islets.

The article contains numerous tables and is followed by an extensive bibliography.

M. E. Moore, M.D.

Craig, W. McK., and Brown, G. E.: Unilateral and Bilateral Resection of the Major and Minor Splanchnic Nerves: Its Effects in Cases of Essential Hypertension. *Arch. Int. Med.* 1934, 54, 377.

The problem of the selection of patients in essential hypertension for operation is more complex than the selection of patients with occlusive diseases of the peripheral arteries for sympathetic gangliectomy. It is desirable to determine pre-operatively the probable effects of the operation on the levels and responses of the blood pressure by temporarily blocking the splanchnic nerves.

The authors found that under spinal anesthesia to the level of the nipples induced with small doses of from 50 to 80 mgm. of procaine hydrochloride, the blood pressure was lowered and the vasomotor responses were greatly diminished or obliterated. The abolition of thepressor reactions by this procedure indicates the neurogenic mediation of these reactions. Untoward effects of lowering of the blood pressure are not noted. Spinal anesthesia anesthetizes not only the splanchnic nerves, but also the lower sympathetic chain and the motor and sensory nerves to the lower extremities and abdominal wall. In spinal anesthesia extending to levels as high as the nipple a greater number and additional types of nerves are blocked than are blocked by splanchnic sympathectomy.

The degree of organic hypertrophy of the musculature of the arterioles is of great importance in predicting the probable postoperative depressor effects. This can be determined by careful examination of the retinal arterioles and by noting the presence or absence of spastic phenomena. Pathological study of arterioles of specimens of muscle removed for biopsy gives decisive information as to organic grading and the prognosis. It must be recognized, however, that the degree of change in the arterioles is not uniform throughout the body and too exact deduction cannot be made from the changes in one group of arterioles. Craig and Brown are of the opinion that for operation in a case of hypertension the subject should be less than forty-five years of age, the levels and responses of the blood pressure should be markedly variable, and changes present in the smaller arterioles should not be advanced and severe, degenerating changes should not have occurred in the kidneys, heart, or brain. These are the major requisites. A basal level of the diastolic blood pressure of more than 120 is desirable.

Essential hypertension is assumed to be the result primarily of (1) a hyperactive vasomotor center

## SURGERY OF THE NERVOUS SYSTEM

with exaggerated pressor responses from psychic, sensory, chemical, or hormonal stimulation, (2) organic hypertrophy of the arterioles consecutive to the excessive, rapidly varying intra-arterial stresses, and (3) superimposed renal sclerosis and associated vasospastic reactions in the more advanced stages. The two last-mentioned conditions are believed to be peripheral while the first condition is believed to be central. Theoretically, operative measures which block the central mechanism from the splanchnic circulation should be effective in the absence of marked disturbance of the peripheral mechanism.

This concept of the various stages in essential hypertension is useful in the interpretation of postoperative results. It emphasizes the stage of the disease in which the most striking improvement from operation should be obtained.

Five patients with essential hypertension of varying severity were subjected to unilateral or bilateral resection of the splanchnic nerves and removal of the first lumbar ganglion. In two subjects a significant quantitative reduction of the pressor reactions to cold resulted. In one subject subjective and objective improvement was striking. In the most severe forms of essential hypertension with early renal involvement and advanced organic changes in the arterioles the effects on the blood pressure have not been striking.

In conclusion the authors state that resection of the splanchnic nerves is a relatively safe operation. No untoward effects from it have been noted. Further application of this surgical procedure is justifiable in the early stages of the severe progressive forms of essential hypertension in young persons.

# SURGERY OF THE CHEST

## CHEST WALL AND BREAST

Garnier, C. The Surgical Treatment of Funnel Chest (Traitement chirurgical du thorax en entonnoir) *Rev d'orthop* 1934, 4, 355

Garnier reviews the history of the various operations performed for the correction of funnel chest or "pigeon breast." The operation developed by Ombrédanne and the author and used in seven cases consists of section of the costal cartilages of the third to the sixth ribs on both sides, T-shaped section of the sternum, wiring of the sternum, and the adjustment of an orthopedic apparatus to maintain traction. The apparatus is worn for from thirty-five to forty days. Subsequently a corset is worn for at least two months to maintain the correct posture. Respiratory exercises are prescribed to increase the chest expansion.

More recently the author has devised an operation for pigeon breast which does not involve section of the sternum. He has performed it on two children. The patient wears an orthopedic corset before the operation, and the operation is performed with the patient lying on the posterior half of the corset with the anterior half removed. The operation is done in two stages separated by an interval of six to seven days in order to avoid a long operation and to provide a gradual decompression of the heart. In the first stage a channel is cut in the upper part of the sternum (not a complete section) in order to mobilize the sternum and the costal cartilages of the third to the eighth ribs are resected on one side, preferably the left. In the second stage the costal cartilages on the other side are resected and the orthopedic apparatus is adjusted to exert traction. For traction the author has devised special traction forceps which are attached to the lateral borders of the sternum. The anterior half of the corset is replaced to assist in holding the traction apparatus in place. This apparatus is not removed until the forty-fifth day after the second stage of the operation. The corset is worn for at least two months more, and respiratory exercises are prescribed.

The first operation described is long and apt to cause shock in the first twenty-four hours. Two of the patients subjected to it died from cardiac failure and third died with anemias and ascidos five days after the operation. With the second operation, performed in two stages, shock and cardiac damage are avoided. The author has found that the second operation gives equally satisfactory results and is of the opinion that an operation of this type is the method of choice in cases of funnel chest. He maintains that such an operation is indicated in any case in which the thoracic deformity compresses the thoracic organs and causes pulmonary or cardiac symptoms, whether the

deformity is congenital or due to trauma and whether the patient is an adult, an adolescent, or a child.

ALICE M. MITCHELL

Haiman, J.: The Study of Benign Neoplasms of the Rat's Breast. *Am. J. Cancer* 1934, 37, 497

Benign fibromata and fibro-adenomata of the rat's breast are easily and continuously transplantable. When transplanted, they grow not only in the region of the mammary glands but also in the axillary grooves, the nape of the neck, the outer side of the thigh, and the abdominal cavity. The transplanted tumors do not always retain the structure of the spontaneous tumors from which they were derived. The transplantability of a tumor is not a criterion of malignancy. Although the growth energy of the tumors discussed fluctuates widely, there has been no cessation of growth in one series for fifty-three generations, in a second series for thirty-three generations, in a third series for thirty-two generations, and in a fourth series for sixteen generations, during a period of ten years.

Tumors of this type grow as readily in adult rats as in young rats. In the former the growth tends toward glandular hyperplasia, and in the latter toward a marked increase of fibroblasts. It was found that three of the six primary fibro-adenomata of the breast which were transplanted through four or more generations became actively growing cellular tumors with the morphological structure of sarcomata. Some of the tumors ulcerate through the skin, but the ulceration is due only to pressure on the skin and is not an evidence of malignancy. With a large number of inoculations and the implantation of two or more fragments 3 mm. in diameter these benign tumors are readily transplantable for many generations in suitable hosts. When the benign tumors develop into sarcomata smaller and fewer fragments are required for transplantation. One such tumor has been transplanted by the trocar method with the use of 3 mgms of tumor substance, for fifty six generations. Of sixteen rats with spontaneous benign tumors, six (37 per cent) yielded tumors which were transplantable for from four to fifty-three generations. JOSEPH E. MARAT M.D.

Malinink, J. W. The Prevention of Necrosis in Plastic Repair of the Breast. *Am. J. Surg* 1934, 36, 793

More frequent plastic repair of deformed breasts depends upon the safety of the procedure and the percentage of satisfactory results. The author emphasizes especially the importance of preserving the blood supply to prevent necrosis.

The blood supply of the breast is provided by the external mammary branches of the lateral thoracic

## SURGERY OF THE CHEST

artery, the internal mammary artery, and, to a less extent, the intercostal arteries. There is little anastomosis between these sources. As the areola is supplied from behind rather than from the periphery, a circumareolar incision does not endanger it.

The precautions necessary to prevent necrosis are preservation of the blood supply, which is accomplished most safely by the two-stage procedure, the avoidance of undue tension, the prevention of torsion, careful hæmostasis, the avoidance of undue trauma to poorly resistant fat, and careful approximation of the skin. The most frequent site of necrosis is around the areola or in the flap between the areola and the submammary incision. A thick skin flap permits preservation of the cutaneous vascular plexuses.

THOMAS W STEVENSON, JR, M D

### TRACHEA, LUNGS, AND PLEURA

Pearson, E F Non-Parasitic Cystic Disease of the Lung Its Clinical Recognition and Treatment *J Thoracic Surg*, 1934, 4 84.

Pearson reports nine cases of non parasitic cystic disease of the lung in detail and supplements his discussion of the diagnosis, treatment, and prognosis of this condition with roentgenograms.

Case 1 was that of a male infant eighteen months old who had a ruptured balloon cyst with spontaneous pneumothorax, Case 2, that of a girl twenty-eight months old with a cyst which had ruptured and caused pneumothorax in a lung with a sarcoma, Case 3, that of a male infant one year old who had a cyst complicated by pulmonary infection, Case 4, that of a girl fourteen years old with multiple unilateral cysts simulating bronchiectasis, Case 5, that of a girl eighteen years old with a large cyst which contained fluid and was infected by the Pfeiffer bacillus, Case 6, that of a man twenty-six years old who had a multilocular cyst infected with the bacillus influenzae, Case 7, that of a man thirty-eight years old who had cystic disease associated with bronchiectasis, Case 8, that of a man forty-four years old presenting emphysema with unilateral cyst like areas in the upper lobe, and Case 9 that of a man sixty six years old who had a pedunculated cyst of the pleura.

Cystic disease of the lung causes clinical symptoms of the widest variety. It may simulate clinically and roentgenologically pneumothorax, tuberculosis, bronchiectasis, lung abscess, empyema, emphysema, and other chronic lung diseases. The diagnosis is difficult, requiring all diagnostic aids—the history, physical examination, X-ray examination with iodized oil, diagnostic pneumothorax, and operative exploration. The treatment in a given case depends upon the symptoms, number, size, and contents of the cysts, and the presence or absence of associated pulmonary and upper respiratory infections. If the cysts persist for years with infection successful therapy requires their radical surgical removal.

J DANIEL WILLEMS, M D

Coryllos, P N Thoracoplasty Versus Pneumothorax *J Thoracic Surg*, 1934, 4 30

A comparative study of the respective advantages and shortcomings and the physiological action of the two outstanding methods of collapse therapy for cavernous pulmonary tuberculosis, namely, pneumothorax and thoracoplasty, leads the author to the following conclusions.

The routine application of bed rest, pneumothorax, and thoracoplasty with or without phrenic nerve interruption in the order named, and only if the preceding procedure was not successful, constitutes a "hit and miss" treatment which may lead to loss of time and irreparable disasters. Bed rest should not be prolonged beyond the time necessary to make a certain diagnosis of cavities. When once this diagnosis is made, no time should be lost in the hope of the remote possibility of spontaneous closure of the cavities. Collapse treatment should be applied without unnecessary delay.

Pneumothorax should not always be applied before thoracoplasty is performed. Each of these procedures has its own indications. As thoracoplasty is a more efficient and expedient method of treatment than pneumothorax, greater discrimination in the respective indications for these procedures should be attempted.

In cases of cavities of the extreme apex, in which pneumothorax seldom produces efficient collapse, apical thoracoplasty in one or two stages with resection of no more than three ribs in each stage is the method of choice and no time should be lost in an attempt to induce pneumothorax. Good results are obtained in from 60 to 80 per cent of the cases and the mortality does not exceed 5 per cent.

When the condition of the patient allows it, thoracoplasty is a better procedure than pneumothorax also for unilateral lesions with marked destruction of pulmonary tissue. Very often, in cases of such lesions, re-expansion of the lung cannot be obtained after prolonged collapse by pneumothorax and continuation of the pneumothorax for life becomes necessary.

In the cases of toxic or aged patients pneumothorax should be attempted first. If a successful collapse is obtained, it should be continued, but if the pneumothorax is not successful thoracoplasty should be performed without delay if and when the condition of the patient permits it.

In bilateral cases in which the process is located exclusively in the apices above the second rib, bilateral thoracoplasty is the method of choice. From three to five ribs may be resected on both sides with no greater danger than in unilateral cases. This procedure allows preservation of lower lobes, which with bilateral selective pneumothorax is possible only exceptionally.

When pneumothorax has not produced a satisfactory collapse and section of adhesions cannot complete the collapse, thoracoplasty should be performed without delay as incomplete pneumothorax is dangerous.

When pneumothorax cannot be induced, thoracoplasty should be performed without losing time in the hope of spontaneous cure.

For cases in which there are basal cavities or cavities located very close to the hilum, pneumothorax appears to be a better procedure.

J. DANIEL WILLIAMS, M.D.

Jessen, H. L. Thoracoplasty in Bilateral Cavernous Tuberculosis. *J. Thorac. Surg.* 1934, 4, 1

Thoracoplasty in bilateral tuberculosis produces a permanent state of lung collapse. Tuberculosis is always a disease of the entire organism, a general infection with all the properties of such an infection. Each cavity is a metastatic illness. Moreover tuberculosis is an individual problem with a constitutional and biological basis. There may be a continual change between periods of activity and inactivity. Therefore all surgical treatment must be adapted to the present condition and character of the disease. The correct time for surgical intervention depends upon the general state of the body. Operation is advisable only after a long period of preparation and treatment. Thoracic surgery in tuberculosis deals with an organism damaged by chronically poisoning disease and with toxic weakness of the heart and blood vessels. It does not eliminate the diseased organ, but establishes the mechanical conditions necessary for fibrotic transformation of the tuberculous tissue.

In bilateral cases thoracic surgery is justified only when the patient is sufficiently able-bodied to make use of the help given and the intervention will not cause irreparable damage to the existing power of resistance. In no case of lung collapse is it possible to control the totality of the infection. Nor is this necessary since the purpose of all treatment is deliverance of the organism from the main focus of intoxication, a cavity or a system of cavities.

Total thoracoplasty is possible in bilateral cavernous tuberculosis if the cavity of the better side belongs to the secondary state of allergy; if the general defense of the organism is not exhausted, and if the patient is willing to risk an eventual artificial collapse of the other lung. Total thoracoplasty of the more affected lung is also possible if the better lung presents only small tertiary cavity which can heal after the restoration of a general immunity or with the help of medical treatment alone or with the addition of pleurectomy pneumothorax or partial thoracoplasty. Partial thoracoplasty for both lungs is justified in cases of strictly localized destruction of the top of both lungs belonging to the tertiary stage of allergy.

J. DANIEL WILLIAMS, M.D.

Edwards, A. T., and Thomas, C. F. One-Stage Lobectomy for Bronchiectasis. An Account of Forty-Eight Cases. *Bull. J. Surg.* 1934, 1, 2

In the thoracic treatment of bronchiectasis the non-operative procedures, namely postural drainage, bronchoscopic aspiration, and the use of certain

drugs for their specific action on the spiracles, are employed chiefly to prepare the patient for operation. Collapse methods such as artificial pneumothorax, parenchymotomy and to a small extent partial thoracoplasty are likewise used primarily as pre-operative preparations for radical extirpation of the disease.

Crutry pneumectomy as devised by Graham is still the radical operation of choice in cases of bronchiectasis with associated lung abscesses of large size. The patients with unilateral bronchiectasis who are particularly benefited are those who daily expectorate large amounts of pus with a very offensive odor and those who have repeated hemoptyses.

The technique of one-stage lobectomy, the pre-operative preparation, and the induction of intratracheal insufflation nitrous oxide-oxygen anesthesia are described in detail.

In the operative technique a long curved incision is made at the seventh interspace and curved upward posteriorly. A portion of the seventh rib is resected subperiosteally to limit the postoperative pain, and a rib spreader is introduced to give adequate exposure.

The lobe is mobilized and the hilum isolated. The pleura is well protected with gauze saturated in acriflavine solution and a strip of gauze saturated

with 10 per cent cocaine is wrapped around the hilum of the affected lobe to anesthetize the nerve endings and prevent reflex effects.

The loop of the authors' modification of Sherr's tourniquet is adjusted to the hilum.

Particular care is taken to sponge the cut surface of the hilum as it is divided distal to the tourniquet.

The stump is touched with novarsenobismuth to destroy anaerobic organisms, and the lumens of the main bronchi are cauterized with pure phenol or 30 per cent silver nitrate to destroy the mucous membrane.

Hemostasis is obtained by placing mattress sutures of chromic catgut in the stump. The tourniquet is then removed.

No attempt is made to attach the stump to the adjacent lobe.

The wound is closed in layers, and a catheter is brought out through an intercostal stab wound into a water seal to provide drainage.

In forty-eight cases in which this one-stage lobectomy was done for bronchiectasis there were four deaths associated with the operation and three subsequent deaths from complications. Of the forty-one patients who survived, six have residual symptoms which are slight as compared with their original symptoms and thirty-five are symptomless.

In an appended note the authors state that since the preparation of this report the operation has been done in nine more cases with one death. The total number of cases in which it has been performed is therefore fifty-seven, and the total mortality early and late, is 4 per cent.

FRANKLIN E. WALLACE, M.D.

## SURGERY OF THE CHEST

### HEART AND PERICARDIUM

Beerens, J. Tuberculous Pericarditis (La péricardite tuberculeuse) *Rev belge d sc méd*, 1934, 6 727

This article reports observations on tuberculous pericarditis made over a period of several years. The author states that, according to the literature, few conditions are more difficult to recognize. Difficulty is particularly apt to arise in the absence of a history suggesting the condition. The most common symptoms are precordial pain and dyspnoea. The pain may be extremely severe and felt over the lower sternum, neuralgic and referred to the pleural or interscapular region, due apparently to pleural inflammation, of an anginal character, or very slight or intermittent.

The dyspnoea is not constant. It usually occurs during active muscular effort. Often it is due to limitation of the amplitude of respiratory movements from the inflammation of the pleura or diaphragm. By some, the respiratory phenomena have been attributed to the pressure of fluid on the myocardium.

On physical examination a precordial rub is usually found in spite of the presence of considerable fluid in the pericardial sac. The sound is always superficial, but varies in character and intensity.

Percussion is of aid in outlining the borders of the enlarged pericardium. The left lung may show evidence of compression due to expansion of the pericardium. This is a valuable diagnostic sign.

X ray examination gives the most valuable aid in outlining the cardiac shadow. Rapid changes in the size of the heart shadow usually indicate effusion into the pericardium.

The electrocardiogram may show some alteration in the tracing, but this is due to associated myocarditis.

Four clinical types of tuberculous pericarditis are described, (1) the dry type, which may be acute or subacute, (2) the latent type, (3) pericarditis with effusion, and (4) adhesive pericarditis.

Infectious pericarditis arising from such conditions as scarlet fever and septicaemia is easily recognized as examination of fluid obtained by diagnostic puncture will show the bacteria associated with those diseases. In the cases of old persons, pericardial effusions associated with renal disease may be confused with those of tuberculous pericarditis. The differentiation of tuberculous pericarditis from rheumatic pericarditis may be more difficult. During childhood and adolescence, pericarditis is usually rheumatic. Absence of a history of exposure to tuberculosis and the results of anti-rheumatic treatment will aid in the differential diagnosis. Examination of the pericardial fluid may show the tubercle bacillus. Animal inoculation should be done if the organism cannot be found.

The prognosis in tuberculous pericarditis depends to a great extent upon the progress of the pulmonary lesions and the degree of damage to the heart muscle. Cure may sometimes be obtained from rest and diet

if the general condition is satisfactory. The need for evacuation of the pericardial fluid depends upon the amount that is present and the embarrassment it causes.

MARSH W POOLE M D

Jona, G. Cardiac Symplysis, Brauer's Operation (Sinus cardiaca Operazione di Brauer) *Polclin*, Rome, 1934, 41 sez. prat. 1697

A woman thirty-eight years of age, who, five years previously, had had bilateral dry pleurisy, in February, 1934, suffered a second attack on the left side which was followed by dyspnoea, ascites, and oedema of the legs. On her admission to the hospital she presented the picture of grave decompensation without evidence of a valvular or myocardial lesion but with difficulty in the emptying of the jugular veins, particularly the left, and a smaller radial pulse on the left side. A diagnosis of tuberculous pericarditis was made.

As treatment with rest and cardiac tonics caused only transitory improvement, precordial thoracotomy was decided upon. The favorable factors were the patient's age and good nutrition, the absence of valvular lesions and probably of advanced myocarditis, the good condition of the visceral pericardium as shown by a normal urine, a rapid response to diuretics, and absorption of the ascites, and the absence of other signs of tuberculosis. In short, this was a case of uncomplicated symphysis in which life was threatened by the general circulatory insufficiency.

At operation, the pleura was found adherent to the pericardium and the 2 layers of the pericardium were found completely adherent. The adhesions over the anterior surface of the heart were broken up with difficulty. A portion of the outer pericardial layer was then resected. The diagnosis of tuberculosis was confirmed by microscopic examination. The postoperative course was uneventful except for slight fever lasting fifteen days.

At the time this report was written, six weeks after the operation, there is a slight but definite subjective and objective improvement. The dyspnoea, nocturnal agitation, and feeling of weight in the epigastrium had diminished. The oedema had almost disappeared. The jugular veins emptied fairly well. So far, the surgical result was good in that the object of the operation—improvement of diastolic aspiration—had been attained. However, the total clinical result was less satisfactory. Persistence of myocardial insufficiency was evidenced by a low radial pressure, oliguria, and susceptibility to fatigue on the slightest exertion.

In 1929 Torraca collected from the literature 84 cases in which Brauer's operation was done. Three of the patients died soon after the operation, 15, during the first six months, and 12, between six months and five years after the operation. The operative mortality was therefore 47 per cent and in 25 per cent of the cases death resulted from persistence or recurrence of the disease. In 85 per cent the operation was followed by improvement. In



33 cases the improvement lasted more than a year and in 1 case for sixteen years.

In 1931 Lemoine reported 13 cases with an operative mortality of 53 per cent and survival beyond one year in 61 per cent. In 1933, on the basis of 30 cases, Pansler advocated pericardiectomy claiming that Brauer's catheter is insufficient and its results, although good in plethoric are only temporary. However the improvement following Brauer's operation was in some cases remarkable, amounting to restoration of complete working capacity even in patients who had shown marked circulatory insufficiency. M. E. Moore, M.D.

### ESOPHAGUS AND MEDIASTINUM

Hernberg, R. The Anatomy of the Abdominal Portion of the Esophagus (Die Anatomie des Bauchabschnittes der Speiseröhre). *Deutsche Zeitschrift für Chirurgie*, 1934, 24, 205.

Special attention has recently been directed to the anatomy of the abdominal part of the esophagus in an attempt to explain hiatus hernia and cardiospasm and to determine the operability of diseases of that portion of the esophagus. Hernberg's investigations were undertaken with Hesse and in connection with Hesse's operations on man. Methods of mobilizing the abdominal part of the esophagus were studied on twenty-five cadavers and in twenty-two experiments on animals (dogs, cats, and rabbits). X-ray studies were unsuccessful because of technical difficulties. Sokolow's classification of organ types and their relationship to skeletal forms was found of value. This classification is as follows:

1. Brachymorphous type: primitive form comparatively long trunk (regulopubic distance) and short legs.

2. Dolichomorphous type: highest developmental type, narrow thorax, long limbs.

3. Mesomorphous type: transitional forms. Variability of races and individuals.

The esophageal foramen lies between the ninth and eleventh dorsal vertebrae. It is not canal, but an oblique, almost perpendicular slit. The esophagus is in contact with the diaphragm only on its posterior wall and there for a distance of only from 1 to 3 cm. After entering the hiatus it shows a circular so-called physiological narrowing. The hiatus its wall is quite firmly attached to the fibers of the diaphragm by elastic connective tissue layers which form a continuation of the interpleural ligament (Morosow). Opinions differ as to whether muscle fibers pass from the diaphragm to the wall of the esophagus. Rouget, Gillet, Santoni, Wernscho and Thiele have described striated muscle fibers. Sebatov and Tadden accept their findings, whereas Treitz, Walker, Schwenger, Seidel, Morosow and Cunningham deny the presence of such fibers. According to Hernberg, striated muscle fibers are present only exceptionally.

The existence of an abdominal portion of the esophagus is no longer doubted. This portion is

completely surrounded by peritoneum. In ninety-four examinations, some of which were made on embryos, Hernberg failed to find an abdominal portion in only one specimen. In the latter the esophagus formed a right angle immediately after its emergence from the hiatus. The length of the abdominal portion has been reported variously. Hernberg found the average length to be 1.54 cm. in men and 1.5 cm. in women and the maximum length to be 3.0 cm. The length was greatest in persons of the dolichomorphous type. Age was not a factor but it is certain that pathological changes such as those associated with cardiospasm and irritations may be associated with lengthening. In case of cardiospasm Hernberg found an elongation to 15 cm. and in a similar case Bler found an elongation to 21 cm. The average width of the abdominal portion of the esophagus was found by Hernberg to be 1.2 cm. In five cases the limit of distention was between 7 and 8 cm. Hernberg observed that the lesser curvature at the site of the entrance of the abdominal portion of the esophagus into the stomach which was described by him as constant formation which does not disappear even when the stomach is empty. He recognizes two types—one characterized by considerable depth of the indentation and an acute angle and the other by a shallow indentation and an obtuse angle which in some instances is as great as 50 degrees. The difference between these two types is of practical importance. Esophagostomy, which comes into consideration in the treatment of cardiospasm and benign stenoses, can be done in cases of the second type without mobilization if the esophagus is sufficiently long and rests on the diaphragm, as the anastomosis is made with the corpus of the stomach. It may be done without mobilization also in cases of the first type if the anastomosis is made with the fundus of the stomach. In the presence of an incision of an intermediate type, that is, at an angle of from 30 to 35 degrees, esophagostomy is technically impossible. In the mucosa the boundary between the abdominal portion of the esophagus and the stomach is distinctly visible. Even in the fetus it is evidenced by an irregular line 0.5 cm. long.

The arterial supply of the lower thoracic segment of the esophagus through the anterior and posterior esophageal arteries is better than that of the abdominal portion (Deneke's investigations). The posterior surface is better supplied by the left gastric and left phrenic arteries than the anterior surface by the left gastric artery alone. The vascular supply of the lateral surfaces, particularly the left, is much poorer than that of the anterior and posterior surfaces. Mobilization of the lower thoracic portion is easier from the left, as is also entrance into the proper loose connective-tissue layer of the mediastinum. Moreover, an approach from the left the longer communicating branches between the thoracic and abdominal portions which run along the right border are much better preserved. The cross blood courses: the vasa coronaria ventriculi superior and

thence to the portal vein. In portal stasis (hepatic cirrhosis) there are varicose dilatations which may lead to fatal hæmorrhage during mobilization. Attention is called also to the very disturbing group of lymph nodes in the cardia. The regional lymph nodes for the cervical and thoracic œsophagus are the posterior bronchial and mediastinal glands.

The relation of the lower thoracic portion to the two pleural folds is also of importance in mobilization. The right mediastinal pleural fold lies at the level of the seventh and eighth dorsal vertebræ immediately on their dorsolateral surface. At the level of the eleventh dorsal vertebra it extends not only to the side but also onto the anterior surface. The left posterior mediastinal pleural fold comes into contact with the œsophagus for only a very short distance, somewhat above the œsophageal hiatus, and at the level of the eighth to the eleventh dorsal vertebræ it extends over the œsophagus.

In the hiatus the left vagus lies on the anterior surface and the right vagus on the posterior surface. In the abdominal portion of the œsophagus and the cardia Herzberg found two types of innervation of the anterior surface by the left vagus trunk. In one there was a rich network of branches, whereas in the other there were only three branches from the main trunk and the cardia appeared to be devoid of nerves. In vagotomy it is of great importance whether the site of division of the vagus is unusually high or low, as is frequently the case. Division below the site of division will be unsuccessful. The right vagus innervates the posterior surface with only about one-third of its fibers. The majority of its fibers course to the right semilunar ganglion. How-

ever, because of the two or three large communicating branches in the thoracic portion of the œsophagus, it is certain that both surfaces of the abdominal portion of the œsophagus and the cardia are innervated by both vagus trunks. The sympathetic supplies the abdominal portion and cardia chiefly through the left gastric, the celiac, and the left phrenic arteries. It is not certain whether there are communicating branches between the vagus and sympathetic.

The cardia is the inlet of the œsophagus into the stomach. It is intraperitoneal. It is immobile, not changing its position even in gastropexia. According to some investigators, it is fixed laterally by the hepatogastric and phrenicogastric ligaments. However, there is a difference of opinion concerning this although it is of importance in operative procedures. Herzberg believes that only the constantly excentric position is nearer the anterior abdominal wall. According to Hacker, the cardia is usually at the level of the tenth or eleventh dorsal vertebra. Maximovic found that in the horizontal position of the stomach it is at the level of the eleventh dorsal vertebra, from 3 to 5 cm. to the left of the midline and in the vertical position, at the level of the tenth dorsal vertebra. In general, its position depends upon the form of the lower thoracic aperture. In persons with a narrow chest and a feminine type of abdomen it is high, whereas in those with a wide chest and a masculine type of abdomen it is low. The mucous membrane of the cardia shows a distinct boundary line between the œsophageal and gastric mucous membrane.

(FRANZ) LEO M. ZIMMERMAN, M.D.

# SURGERY OF THE ABDOMEN

## ABDOMINAL WALL AND PERITONEUM

Duboussé, G., and Desbournets, H.: Prevascular Femoral Hernia (La hernie crurale prévasculaire) *J de chir* 934, 44, 697

The most frequent type of femoral hernia passes through the weak point in the femoral lacuna vasorum, the femoral canal bounded above by Poupart's ligament, laterally by the femoral vein, and medially by Gimbernat's ligament. Variations of this type of hernia include the pectineal, multiventricular and bisacculated (Cooper's hernia) types. The prevascular femoral hernia and the hernia occurring through Gimbernat's ligament are rare.

In the prevascular femoral hernia the sac passes in front of the femoral vessels. At its origin it runs around the epigastric vessels, sometimes medially sometimes laterally, and spreads out in Scarpa's triangle. It is therefore located more laterally than the usual femoral hernia. This type was first described by Arnaud in 1768.

The predisposing causes of the prevascular femoral hernia are found in defects in the fascia transversalis at the orifice where the femoral vessels pass. According to Patel and Moschowitz, the hernia can be explained by lacunae in the crural septum. The exciting causes are the usual causes to which other herniae are attributed—aging, disease, pregnancy, inflammation of the lymph nodes about the femoral vessels at their origin, traumas, notably the surgical traumas involved in the reduction of congenital dislocation of the hip and deformities such as tilting of the pelvis leading to deviation of the femoral vessels and traction on the orifice of exit.

The hernia is always a "hernia of weakness" (hernie de faiblesse). It occurs in aged or debilitated individuals, and is usually associated with an inguinal hernia of the same or the other side.

The neck of the hernia is always large, admitting from 1 to four fingers, whereas that of the ordinary femoral hernia is small. It is limited medially by Gimbernat's ligament or the thick fibrous septum separating the crural infundibulum from the femoral vein, laterally by the iliopectineal band, anteriorly by the mid portion of Poupart's ligament, and posteriorly by the femoral vessels. Because of the large neck, symptoms due to strangulation are rare.

The treatment of these herniae has never been standardized. All of the surgeons encourage such herniae have improvised a procedure which to the moment seemed to give the best prospects of restoring the abdominal wall. Most surgeons have made vertical incision over the bursal sac and transverse incision over the inguinal canal.

In the operation performed by the authors the inguinal pouch is used in order that the sac may

be resected as high as possible and the neck fixed in front of the original orifice (Barber's maneuver). The incision is made just above and parallel to Poupart's ligament. This incision exposes the inguinal canal, Cooper's ligament, and the lower oblique and transverse muscles. Beginning medially the cord is retracted and the lateral border of Poupart's ligament is fixed to Cooper's ligament by a series of sutures. Laterally Poupart's ligament is sutured to the aponeurosis of the psoas muscle, just sufficient space being left for the passage of the femoral vessels.

ALBERT F. DE GAUL, M.D.

Gehrke, H.: The Relationship of the So-Called Unifoliated Adenomas to the Apocrine Sweat Glands and Adenocarcinoma of the Breast (Die Beziehungen der sogenannten Nabeldrüsen zu den apokrinen Schweißdrüsen und zur Adenocarcinoma der Mammea) *Arch f path A u* 934 193, 191

The author examined microscopically an umbilical tumor the size of a chestnut which occurred in a woman eighty-nine years of age grew to this size in a period of six months, and was removed surgically. At operation, no intra-abdominal complications were found (metastasis from an intrapancreatic carcinoma had been suspected). The patient died nine months later of pneumonia. Autopsy was not done.

On microscopic study gland ducts with wide lumina and others with papilla-shaped elevations were found in the center of the tumor. In the peripheral portion the gland ducts are considerably narrower. The epithelium varied from cylindrical to flat cubical as in large cysts, but, in addition, stratified cubical cells are found. Central and peripheral portions of the glands were embedded in myxomatous tissue which also showed mucous staining. Toward the periphery a continuous transition into groups of sweat glands was demonstrable. The sweat glands were of the so-called apocrine type.

In agreement with Schleiermacher the author defines apocrine sweat glands as sweat glands in which the secreting epithelium gives off part of its cell bodies in its secretion. In this respect these glands are similar to the mammary glands. In contrast to the apocrine sweat glands are the numerous sweat glands in the human body which are of an eccrine nature, that is, sweat glands from which excretion occurs without partial loss of the cell components. In the male, the apocrine sweat glands are to be found only in the axillae and the areole of the nipples, whereas in the female they are distributed much more widely being found in the axillae, the areole of the nipples, the pubic region, and the lower part of the abdominal skin below the umbilicus. They are considered accessory sexual glands and

they participate in the menstrual cycle. As the occurrence of apocrine sweat glands in the region of the female umbilicus has been established, the development of the described tumor from these glands was probably entirely spontaneous, especially as this disease, called "umbilical adenofibrosis," occurs only in females. The change of the connective tissue into myxomatous tissue corresponds exactly to the changes occurring in the mammary glands during the menstrual cycle. At any rate, the assumption that the tumors have their origin in apocrine sweat glands is much more plausible than the assumption that the cystic tubes are so-called heterotopic endometrioid proliferations and the tumors are formed from peritoneal endothelium. Moreover, there are other noteworthy similarities between adenofibrosis of the umbilicus and fibromatosis of the mammary glands.

(MAX BUDDE) LOUIS NEUWELT M D

Repetto, E. Fibroma of the Anterior Abdominal Wall (Fibroma della parete addominale anteriore) *Polichin*, Rome, 1934, 41 sez chir 564

Fibromata of the anterior abdominal wall have been called "desmoids." Although over 1,000 cases of these tumors have been reported in the literature, the author is led to report another case because of the uncertainty of the etiology.

The author's patient was a woman thirty years of age who had first noticed a tumor the size of a pigeon's egg in the right lower quadrant of the abdominal wall about eight months before she came for examination. The neoplasm was painless and caused no subjective disturbances. During the eight months since its discovery it had gradually increased in size. Physical examination revealed an ovoid tumor about the diameter of the index finger and about 6 cm long between the antero-superior spine of the ilium and the umbilicus. The mass was fibrous, hard, moderately fixed, and not tender. Its surface was smooth. When the abdominal muscles were contracted it seemed to be situated behind the muscle planes. Pelvic examination was negative, as was also the cutaneous test for tuberculousis.

At operation, the tumor was found between the peritoneum and the muscles. It was adherent to the transversalis close to the margin of the rectus sheath. It was removed with the adherent muscle.

It measured about 5 by 2 cm and was well encapsulated except in one region where it was continuous with some muscle fibers. It cut with some resistance. In places the surfaces made by cutting seemed to show a fascicular structure whereas in other places the surfaces appeared plexiform. Their appearance was uniformly that of mother of pearl. No cystic areas or areas of degeneration were noted.

Microscopic examination revealed several characteristic features. In the central zone the bundles of connective tissue passed in varying directions, thus accounting for the fascicular or plexiform appearance noted on macroscopic examination. The blood sup-

ply was poor, consisting of only small vessels. In the vicinity of many of the vessels there were many small cell bodies with little protoplasm and large, round, deeply staining nuclei. In some zones there was an intense perivascular infiltration to the point where the cells were densely accumulated in groups. In some regions these groups were surrounded by normal connective tissue and suggested circumscribed microscopic abscesses. In the peripheral zone of the tumor there was a gradual transition from the connective tissue of the neoplasm to the striated muscle which was attached at this point. In this region, also, areas of perivascular infiltration were noted.

In the discussion, Repetto states that fibromata of the abdominal wall occur almost exclusively in females. They are most common between the ages of twenty-five and thirty-five years, but may appear at any age. Multiple tumors have been found in only 3 per cent of the cases. The tumor is usually located in the lower abdomen and on the right side. The ovoid form is characteristic. As a rule the neoplasms vary in size from that of an egg to that of a small orange, but there are reports of such tumors weighing 17 kgm. The tumor usually seems to originate from the sheath of the muscles of the abdominal wall, especially the rectus sheath. Frequently it is attached to the bone nearby, the propentoneal fat, or the peritoneum, and rarely with the skin and subcutaneous fat.

According to the old theories tumors of this type had their origin in (1) the osteoperiosteal tissue, (2) the perimuscular fat, (3) the internal genitals, (4) trauma, or (5) dysfunction of some of the endocrine glands. The author believes that the neoplasm in his case was due to trauma to the anterior abdominal wall resulting from gradual distention and tearing of the muscles in four pregnancies. He states that in a few cases organisms may gain access to the blood stream during pregnancy and the puerperium and produce a true bacillæmia. Some of these organisms may lodge in the regions where the muscles and aponeuroses are lacerated and cause the formation of microscopic abscesses stimulating the production of new connective tissue.

A LOUIS ROST, M D

Nordlund So-Called Primary Cryptogenetic or Metastatic Streptococcic Peritonitis (Ueber die sog primaere kryptogenetische oder metastatische Streptokokkenperitonitis) *Ann Acad scientiarum fennica*, 1933, 38 Series A, No 1

Streptococcic peritonitis should be considered, almost without exception, as the first and usually the only metastasis of a general sepsis. This complication has such an unfavorable effect on the character of the sepsis, which is dangerous even in its absence, that death results quickly and the sepsis rarely has time to form other metastases.

To establish the diagnosis, puncture and bacteriological examination of the punctate should be done.

In cases in which the course is stormy from the beginning, operation is useless. In milder cases

operation may be tried if it can be done in the early stages of the disease. When the diagnosis is uncertain, the earliest possible laparotomy is indicated.

Streptococcal peritonitis occurs in both adults and children. Of the fifty-seven cases reviewed by the author, forty-seven were those of adults. The condition is as frequent in boys as in girls, but is twice as frequent in women as in men. In 40 per cent of the reviewed cases it was preceded by sore throat, and in 23 per cent by coryza, a cough, or some other general infection. Other etiological factors are pneumonia, scarletina, otitis media, and maxillary sinusitis. In 9 per cent of the reviewed cases the peritonitis was preceded by diarrhea.

As a rule the course of the disease is stormy from the outset. In only 23 per cent of the cases reviewed was it mild at first. A characteristic feature is an initially high fever revealed especially by the rectal temperature. The axillary temperature frequently gives no indication of the temperature of the body as a whole. As a rule the circulatory organs are uniformly markedly affected from the beginning and the circulation is seriously impaired. Occasionally streptococci have been found in the blood. Disturbances of consciousness occur in 25 per cent of the cases. In some cases there is euphoria. Frequently the condition is markedly septic.

Among the most important symptoms is abdominal pain which develops almost without exception in the beginning of the condition and immediately becomes more severe and diffuse or at first is local and later becomes diffuse. Vomiting is an early sign in 50 per cent of the cases. It sometimes begins soon after the onset of the disease. As a rule it is continuous. Often typical peritoneic vomiting does not begin until the late stages. The diarrhea which is considered especially characteristic of peritonitis occurred in only half of the reviewed cases. It was an early sign in barely one-third of the cases in which it developed. Quite often there is constipation in the beginning of the disease. In a few cases constipation developed later. The abdomen is usually distended. As a rule there is generalized abdominal tenderness. Localized tenderness is rare. Muscular rigidity is rarely absent, but varies in intensity in different cases and at different times in the same case. In 21 per cent of the reviewed cases the urine contained albumin, and in one case there was definite nephritis. In 3 per cent suppurative metastases were found.

The serosa is reddened and covered by deposits of fibrin. The abdomen contains exudate which in the beginning is clear but soon becomes cloudy seropurulent, or purulent and shows foci of fibrin. In about 10 per cent of the reviewed cases slight recent changes are demonstrable in the appendix, and in 4 per cent in the adrenals. These were not the cause, but the results, of the disease.

In the cases in which operation was done the mortality was 94 per cent and in those in which operation was not done it was 100 per cent.

LOUIS NICHOLAS, M.D.

## GASTRO-INTESTINAL TRACT

Nogara, G. The Nature of the Healing of Surgical Wounds of the Stomach in Relation to the Technique of Suture Employed (*Sulla modalità di contrattazione delle ferite chirurgiche dello stomaco in rapporto alla tecnica di sutura impiegata*) *Arch. ital. chir.* 934, 26 1

The author first reviews the postoperative complications which may develop from faulty suturing in gastro-intestinal surgery citing the literature. Among these are peritonitis from infection entering through the suture line, pulmonary complications, hemorrhage, peptic ulcer and imperfect functioning of the stomach. The incidence of pulmonary complications reported in the literature ranges from 6.0 to 28 per cent. The frequent presence in the pleural cavity of the organisms found at the site of operation suggests hematogenous transmission of the infection. Nogara emphasizes that pulmonary complications occur less often when great care is taken in the technique of the operation, but are favored by the anesthetic. He emphasizes also the importance of careful handling of the tissues to prevent the formation of emboli which may carry infection with them. Hemorrhage may be controlled by accurate suturing. The development of ulceration at the site of the stomach is favored by imperfect apposition of the mucosa and all other factors which interfere with wound healing. Imperfect functioning of the operative stomach is manifested by the usual signs of gastric obstruction—foal breath, epigastric distention, and gastric distress—which require periodical gastric lavage. The suturing is considered responsible even for temporary malfunction of the anastomosis due to local edema.

Because of the importance of these complications the author undertook an experimental study of methods of suturing. He reports his findings and reviews the experimental work of others. He regards as particularly important the recent work of Martzloff and Seckow who investigated seven methods of gastro-intestinal suturing. Martzloff and Seckow found that the method of Halsted is followed by the most rapid healing and the fewest complications, that suture of the wall in three layers is not necessary and that healing of the mucous membrane is not retarded by this method.

Most gastro-intestinal wounds are sutured by the Connell method or some variation thereof. One variation is the Lockitch method. While the Connell method and its modifications bring the mucous membrane together and favor hemostasis, they are frequently followed by ulcerations along the suture line as the approximation of the tissues is not exact, the suture itself causes some constriction which interferes with the nutrition of the mucous membrane, and the sutures which pass through the entire wall of the intestine greatly increase the danger of peritonitis. The author believes that if the layers were sutured separately the difficulties would be avoided.

# SURGERY OF THE ABDOMEN

In the restoration of anatomical continuity the single interrupted sutures have proved most successful and least damaging to the tissues. However, because of the excess of mucosa in relation to the underlying muscularis which contracts, an empty space is left between the stitches. Dehitala attempted to overcome this defect by using interrupted sutures in the mucous membrane and continuous sutures in the submucosa and muscle. However, because of the associated tissue damage and the time required for a suture of this type, his method was not considered ideal. It was therefore necessary to continue efforts to devise a suture which would be simple and extramucosal and which would evert the mucous membrane and arrest bleeding. The Lembert continuous seromuscular suture is of this type, but requires separate ligation of the bleeding points.

Also satisfactory in some respects is the method of approximating the separate layers as they are divided with a continuous suture excluding the submucosa. However, while wounds so sutured heal well, healing requires considerable time, separate hæmostasis is required, some of the bleeding points are apt to be missed, an unnecessary amount of material is introduced into the wound, and enterostomy clamps cannot be used.

A suture which is extramucosal and inverting, simple, certain, and rapidly executed is that of Donati. The technique of this suture is as follows.

The surgeon standing in front of, and parallel with, the wound, begins the suture in the lower angle of the wound, introducing the needle into the submucosa just at the level of the muscularis, and bringing it through the submucosa and muscularis, and bringing it out from the serosa just proximal to the outer edge of the wound. He then introduces it a few millimeters from the opposite edge, directs it from the serosa obliquely downward from right to left through the serous and muscular coats to the submucosa, passes it along the external wall of the mucosa, and brings it out near the cut edge of the mucosa. The suture is then pulled up and a knot is made. The knot is buried and the sutured edges are inverted so as to bring the serous edges into apposition. Each stitch is made in the same way and the suture from each is drawn up. Perfect approximation of the serosa results. To tighten the suture and hold the stitch firmly, Donati uses traction on the suture and exerts pressure with a gauze pad on the walls which he is drawing together.

The Donati suture is designed to take up all of the submucous layer to the edge of the cut mucosa. Unless this is accomplished good hæmostasis is not obtained and loose edges which retard healing are left. After the completion of this suture an interrupted seromuscular suture of silk or fine linen is introduced. Catgut is usually employed for the buried inverting suture. In the experimental wounds described this was apparently the method employed as Nogara says that the catgut disappeared slightly sooner than the silk or linen and that both of them

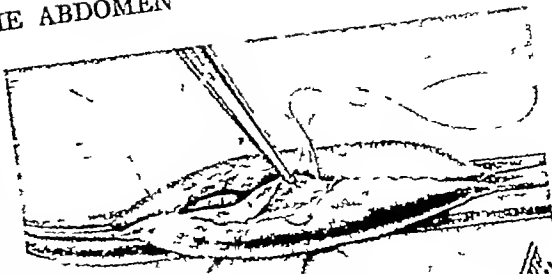


Fig 1 Donati extramucosal suture First step Needle picking up the submucosa with its veins, the muscularis, and the serosa of one side

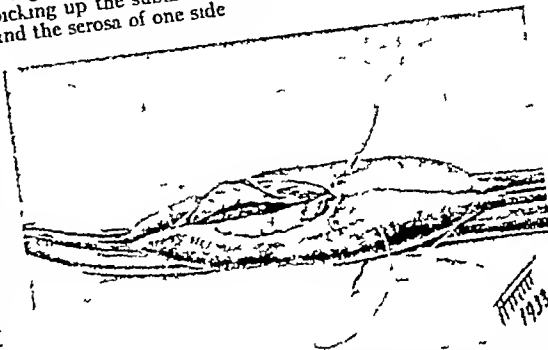


Fig 2 Donati extramucosal suture Second step Needle picking up the serosa, the muscularis, and the submucosa and its veins on the other side.

were still visible on the fifteenth day. At the present time Donati applies his suture only to the anterior wall of the anastomosis.

The advantages of the Donati suture may be summarized as follows:

- 1 Accurate apposition of the two lips of the incision is obtained as the stitch coming from the muscularis takes in all of the submucosa up to the cut edge of the mucosa and when it is tightened the mucosa and muscle layers are brought to the same level. No matter what the degree of muscular contraction or the amount of excess mucosa the apposition is accurate.

- 2 Hæmostasis is always good as the vessels which pass through the submucosa are securely and tightly held, being totally included in the suture.
- 3 An enterostomy clamp may be used to prevent the invasion of septic material into the operative field and to produce hæmostasis.

The purpose of this article is to report the comparative results in surgical wounds of the stomach sutured by the method of Connell, a continuous lockstitch, and the method of Donati.

Nine dogs were operated upon after twelve hours of fasting. The operation was performed under local

anesthesia supplemented with morphine. Three incisions were made on the anterior surface of the stomach and each was closed by one of the three methods of suturing mentioned. Gastro-enterotomy was not done, as Nogara wished to observe wound healing without the complications arising from nutritional disturbances. Three of the dogs were killed after five days, three after eight days, and three after fifteen days, and macroscopic and microscopic studies were made of the wounds.

On the fifth day after the suturing the line of the extramucosal suture was always regular with perfect apposition of the mucosa and other layers, whereas the line of the Connell and lockstitch sutures was irregular and showed areas of necrosis

and ulceration. The irregularity as more marked following the Connell suture than following the lockstitch suture. The microscopic findings in the three suture lines after five days are summarized in Table I.

On the eighth day macroscopic examination showed the Connell suture line to be regular and free from ulceration, whereas in the wounds sutured with the Connell and continuous lockstitch methods there were evidences of ulceration. The microscopic findings are shown in Table II.

On the fifteenth day macroscopic examination revealed no ulceration along the suture lines and no local congestion. The findings of microscopic examination are shown in Table III.

TABLE I MICROSCOPIC FINDINGS IN SUTURE LINES ON FIFTH DAY

	CONNELL SUTURE	CONTINUOUS LOCKSTITCH SUTURE	SMALL SUTURE
Mucosa	Ulceration especially in the antrum, with purulent granules. Free signs of regeneration of the mucosal epithelium.	Fragmentation of the mucosa grouped with characteristic necrotic debris. Little evidence of regeneration.	Regeneration of the mucosa; epithelium generally complete in one layer. Rare interruptions of continuity. No deposits of purulent exudate.
Submucosa	Separation of the muscularis mucosae from submucosa; edematous and infiltrated with discharge exudate.	Separation of the muscularis mucosae. A diffuse inflammatory reaction in the submucosa.	Very little separation of the muscularis mucosae. Beginning regeneration of the mucosa below. Very little inflammatory infiltration of the submucosa.
Muscularis and serosa	Dissection of the muscle fibers with edema and inflammatory infiltration. Frequent ulceration of the muscle process. Inflammation and infiltration in the antrum with the destruction of fibrous strands in the antrum.	Dissection of the muscle fibers with edema and inflammatory infiltration. Few ulcerations at the suture points. Serous and subserous moderately infiltrated.	Very little inflammatory infiltration of the muscle wall. Frequent ulcerations at the suture points. Serous and subserous not infiltrated with exudate. Beginning regeneration with deposition of fibers.

TABLE II MICROSCOPIC FINDINGS IN SUTURE LINES ON EIGHTH DAY

	CONNELL SUTURE	CONTINUOUS LOCKSTITCH SUTURE	SMALL SUTURE
Mucosa	Areas of regeneration of epithelium. Clearly ulcerated areas with characteristic debris.	Areas of regeneration of the epithelium. Clearly ulcerated areas.	Consistent complete regeneration of single epithelial mucosa with the beginning formation of glands.
Submucosa	Beginning connective tissue regeneration of the muscularis mucosae. Some microscopic infiltrations of the newly formed submucosa.	Beginning connective tissue regeneration of the muscularis mucosae. Extensive inflammatory infiltration of the newly formed submucosa.	Advanced connective tissue regeneration. Very little inflammation of the submucosa.
Muscularis and serosa	Marked dissection of the muscle fibers by connective tissue layers. Ulcerations of the muscle process with groups of macrophages. Infiltration in the antrum.	Marked dissection of the muscle fibers by connective tissue layers. Ulcerations of the muscle process with the antrum and the antrum edges.	Very little hyperemia in the muscle layer. Only moderate edema around the suture. Submucosa normal.

TABLE III MICROSCOPIC FINDINGS IN SUTURE LINES ON FIFTEENTH DAY

	CONNELL SUTURE	CONTINUOUS LOCKSTITCH SUTURE	SMALL SUTURE
Mucosa	Regeneration of the mucosa with very few interruptions of the epithelium. Regeneration of new glandular formation.	Regeneration of the mucosa on one epithelial layer.	Areas of total regeneration of the epithelium with good development of glands.
Submucosa	Good reconstruction of the muscularis mucosae. Newly formed submucosa moderately infiltrated with leukocytic exudate.	Good reconstruction of the muscularis mucosae. Some diffuse infiltration of the submucosa.	Reasonable reconstruction of the muscularis mucosae. Diffuse lymphocytic infiltration.
Muscularis and serosa	Muscle tissue with circumferential fibrous formation and some diffuse polymorphous infiltration.	Very thick fibrous formation. A slight diffuse inflammatory reaction.	Very little pathology of the muscularis layer. Rare diffuse infiltrations which are disappearing.

CONNELL J. KRAMER, M.D.

# SURGERY OF THE ABDOMEN

Zanardi, F. The So-Called Enterochromaffin Gland  
(Sulla cosiddetta ghiandola enterochromaffine) *Arch ital di chir*, 1934, 37 749

The term "enterochromaffin gland" is applied to a particular type of cell scattered in the mucosa throughout the intestinal tube of man and vertebrates and characterized by the presence in the cellular protoplasm of granules which are stained selectively by chromium salts and are impregnable by silver.

The morphology of these cells is well settled, but their origin and function are not thoroughly understood. Their clinical significance lies in their rôle in the formation of carcinoid tumors and neuromata and the repair of mucosa.

The author reviews the literature concerning the morphology and differentiation of these cells from such similar cells as the cells of the adrenal medulla and pigment cells containing melanin.

According to one theory, these cells represent epithelial cells with an external secretory function. The author reviews the anatomical and experimental findings which seem to support this hypothesis. According to another theory, these cells are cells of nerve origin (like the cells of the adrenal medulla) which have migrated to the intestinal mucosa, but retain their power of internal secretion. This theory seems to have wider acceptance than the first one. The secretion has been compared to both adrenalin and secretin—to the latter, on the basis of the large number of chromargentaflin cells in the duodenum of certain animals. According to a third theory, the cells represent mobile elements of the blood or connective tissue. Some observers claim to have followed them from a connective tissue origin to epithelium.

The significance of the chromargentaflin cells in pathological conditions of human tissues is not understood. The cells are probably related most intimately to carcinoids of the appendix vermiciformis. They may play a rôle also in gastritis.

Zanardi studied the distribution of these cells in the various segments of the gastro-intestinal tract of man and animals, the affect of digestion on their number and distribution, their rôle in the regeneration of the mucosa of the intestine, and their occurrence and distribution in the vermiform appendix changed by disease.

In his study of the regenerating mucosa in pathological changes in the stomach such as ulcers, inflammations, and tumors, it was impossible to demonstrate a connective tissue origin of the cells. The chromargentaflin cells did not seem to take an active part in the regeneration as they were not present in the regenerating tissue. However, they were numerous in the zone surrounding the area of destruction and therefore may have had an indirect action. In specimens of chronic appendicitis many large chromaffin cells were noted and at times gave the appearance of an intranervous migration suggesting that they may be of ganglionic origin.

A. Louis Rossi, M D

Lucarelli, G. The Suprarenals in Acute Intestinal Occlusion (Le surrenali nell'occlusione intestinale acuta) *Chir chir*, 1934, 10 956

The author describes experiments in which he brought about acute intestinal occlusion in male guinea pigs, in some at a high level and in others at a low level, and after the death of the animals made histological examinations of the suprarenal glands. All of the animals died with the same symptoms, but those with high occlusion died after from twelve to twenty-five hours, whereas those with low occlusion survived for ninety-two hours.

The cortex of the suprarenals showed hyperæmia, hæmorrhage, degenerative changes, and a decrease in and irregular distribution of the lipid content. The medulla showed hyperæmia, a reduction of the protoplasm, a decrease in the size of the nuclei of the cells, and a decrease in the intensity of the staining reaction for chromaffin. The adrenalin granules were greatly reduced in number and those that remained were irregularly distributed. The changes in the cortex were circulatory and degenerative. In the medulla the greater part of the adrenalin had been eliminated and the capacity for producing adrenalin had probably been paralyzed.

As the changes were very much like those seen in toxic infectious diseases, the author concludes that they were caused by the toxins produced by the intestinal occlusion. AUDREY GOSS MORGAN, M D

Piergrossi, A. Jr. Duodenal Diverticula (Diverticoli duodenali) *Radiol med*, 1934, 21 875

The author's discussion is based on a review of the literature and cases of duodenal diverticula he has observed.

Piergrossi divides duodenal diverticula into two groups, the true, composed of all layers of the duodenum (although eventually the muscular layer is rarely normal, being thinned out by distention of the diverticulum) and the false, composed of only the internal layer of the duodenum. In the process of development the latter may result from the former. Diverticula occurring on the convexity of the duodenal loop are rare. Those developing on the concavity occur in several positions such as the lateral recess of the duodenal bulb, about the ampulla of Vater, in the concavity of the inferior knee, and at the duodenojejunal angle.

Neither the theory that the diverticula are congenital nor the theory that they are acquired is applicable to all cases. Against the theory of a congenital origin is the fact that the diverticula rarely become manifest before the second half of life. In favor of this theory is the fact that in most cases there is no pathological lesion which could conceivably result in diverticula formation, the frequent association of the diverticula with congenital anomalies, the fact that diverticula of the duodenum have been observed in the newborn, the not unusual occurrence of pancreatic rests in the walls of the diverticula, indicating a disturbance in embryonic development, the fact that the portion of the human



embryo which subsequently forms the duodenum is particularly active from the standpoint of development in the young embryo from 7 to 2 mm in length and the fact that there is abundant opportunity for an arrest or disturbance of development, abnormal cellular inclusions, and imperfect involution. Some observers claim that the congenital origin may be explained on an evolutionary basis. In support of this theory they cite the diatercula formation occurring normally in the upper intestine of certain fish.

According to the theory of an acquired origin, pulsion or traction are causal agents. Weakening of the bowel wall and increased pressure in the lumen are assumed. The enlargement of the wall of the duodenum is generally attributed to the presence of aberrant pancreatic tissue in some instances and to abnormal penetration of the bowel wall by blood vessels in others. Some theories of formation due to healed ulcers is also believed to be a factor. The increase in pressure in the bowel lumen, while not considered essential in the genesis of these diverticula, is regarded as very important.

Traction diverticula are rare. The traction may be caused by congenital peritoneal bands or by adhesions secondary to such factors as ulcers, cholecystitis, appendicitis, or trauma.

Diverticula are subject to pathological changes. The latter are initiated by stagnation of the intestinal contents or the presence of foreign bodies in their lumen. The development of inflammatory changes is similar to that of appendicitis. Perforation of a diverticulum may result in the formation of a duodenal fistula. The presence of an ulcer may lead to intestinal hemorrhage. The frequent association of a diverticulum of the first portion of the duodenum with duodenal ulcer raises the question as to which is the primary lesion.

In diverticula about the ampulla of Vater and the inferior knee of the duodenum the frequently associated biliary and pancreatic lesions are due to a combination of stasis of secretion and infection and, in some cases, to an incompetent sphincter of Oddi permitting regurgitation. In some of his own cases of duodenal diverticula the author has found roentgenological evidence of chronic appendicitis.

As the symptoms of duodenal diverticula vary a positive diagnosis can be made only by X-ray examination. In the majority of cases symptoms are first manifested during the fifth or sixth decade of life. The average age at which they first occur is fifty-six years. Not all duodenal diverticula produce symptoms. The symptoms are due to inflammatory (functional), or organic lesions produced by the diverticulum on neighboring organs. Hence some patients present symptoms of dyspepsia (pyrosis, nausea, a sense of fullness) others an ulcer picture and still others symptoms of pyloric stenosis, gall bladder disease, pancreatic disease (pain, steatorrhea, diarrhea, and cachexia) or appendicitis.

Therefore the presence of such symptoms the roentgenologist must bear the possibility of duo-

denal diverticulum in mind. The X-ray shadow of diverticulum has three fundamental characteristics, constancy under pressure, mobility on palpation, and persistence (sometimes for days) after the main stream of barium has passed on. However while such characteristics are usually of aid in the diagnosis, they lose their importance in certain cases and consequently must be interpreted with care. The author describes in detail variations in the typical X-ray findings and discusses the conditions giving rise to distorted shadows or absence of shadows. The greatest difficulty is encountered in not bleeding the exact position of the lesion. The site of the diverticulum is of importance in surgical intervention.

The author next discusses the diagnostic difficulties encountered in various types of diverticula, considering each group in detail and citing cases exemplifying each.

The prognosis and treatment depend on the complications provoked by neighboring or distant organs. Medical treatment is, of course, purely symptomatic. Surgical treatment is difficult. Often it is difficult even to find the diverticulum. The author employs various surgical procedures, depending on the location of the diverticulum. In some cases he performs a simple gastro-enterostomy to place the diverticulum at rest. In others, excision or invagination of the diverticulum plus gastro-enterostomy and others, resection of the duodenum.

T. BAYNES JONES, M.D.

Dall'Acqua, V. and Valsaricchi, R. The Roentgen Appearance of the Normal Masses of the Colon (L'aspetto radiologico della massa normale del colon). *Radiol. med.* 33:4, 745.

The first signs of pathological change can be detected by examining the mucous membrane relief of hollow organs as the earliest changes generally occur on the surface of the mucous membrane. Such an examination is made by distributing a thin layer of contrast medium over the inner surface of the organ. In the case of the colon a careful technique is necessary to obtain uniform distribution of the contrast medium. The patient is prepared by giving olive oil as a purgative for one or two days before the examination. Saline solutions are too irritating. The diet should be chiefly liquid. The opaque enema is preceded by one or two cleansing enemata of warm water, the last one being given one or two hours before the opaque enema to allow time for absorption of all of the water. Either barium or colloidal thorium preparations may be used as contrast media. To prevent spasms and over-expansion the fluid is allowed to flow in under low pressure. If functional spasms occur the sphincter may be overthrown by changing the patient's position or by massage. As soon as the caecum is filled the enema is stopped. The caecum should not be over-distended as otherwise the last loop of the ileum may fill and interfere with the clearness of the picture. Sometimes retrograde filling of the pyro-

# SURGERY OF THE ABDOMEN



Fig 1 Normal mucosa of the colon during motion



Fig 2 "Braided ribbon" appearance of the colonic mucosa in a case of mucous colic Ptois of the left colonic flexure Calcified cysts of the liver

takes place. If desired, this can be brought about by light massage over the caecal region. The patient is first examined in a prone and then in a supine position. All the segments of the colon are examined in all projections so as to obtain a three dimension image. For a special study of the rectum and sigmoid the patient may be examined standing. For examination with the walls of the intestine collapsed, only from 250 to 500 c.cm. of contrast liquid are necessary. This amount fills the lumen without distending the walls. However it is advisable to make an examination first with the intestine distended in order to study the tonus distensibility, and elasticity of the walls and any obstacles to distention. The colon should then be examined again after evacuation of the opaque enema. Insufflation of gas may be useful as a supplementary method for the examination of stenoses or serious injuries of the walls. This generally obliterates the mucous membrane relief, but shows cancer nodules and polyps very clearly.

A general roentgenogram of the whole colon is first taken and special segments are then examined. The use of the Potter-Bucky diaphragm is indispensable in roentgenography of the large intestine.

In the normal living subject the mucous membrane presents a complicated network of folds which are not fixed and static, but change constantly, adapting themselves to functional requirements. They are dependent to only a very limited degree on contraction of the muscularis propria. This active

autoplastic capacity of the mucosa is a very important factor in digestion and the propulsion of the faeces along the intestinal tract. It makes the mucosa a definite organ with a specific function coordinate with that of the muscle layer.

The size, number, and arrangement of the folds are affected by all the functional changes of digestion including turgor, secretion, and vascularization of the mucosa. Under normal conditions the folds can be made to flatten out and disappear by external pressure. Under pathological conditions they may become rigid and inelastic. In the transition stage between the rest and movement the mucosa presents an arborescent appearance. The simplest folds are the longitudinal type. In the presence of this type the mucous surface is reduced and there is only slight absorption.

The longitudinal folds push the intestinal contents forward. They are seen chiefly in the descending colon and sigmoid and at the contraction rings. The transverse and arborescent folds are more complex and are seen in segments with greater functional activity such as the caecum and ascending and transverse colons. In the rectum the folds are arranged longitudinally. Their caliber is larger than in other segments of the colon.

Knothe describes as physiological a type of relief which is rarely seen in normal subjects. It is the same as that observed in the so-called irritative condition, but unlike the latter it persists only for a few seconds and is then transformed into one of the other types. Knothe believes that it is due to an

energetic contraction of the whole musculature of the large intestine as a stimulus to defecation. It is called the contraction type.

In increased tones of the vagus whether spontaneous or brought about by drugs, there is a complicated design which Klotz calls the "irritative" or "braided ribbon" type. According to Gilbert and Kadruka, however, the braided ribbon type is only a variety of the arborescent type which is caused by exaggerated neuromuscular tones and not by inflammation. The authors also re of this opinion. Evacuation of the enema is preceded by general contraction of the musculature which produces a picture very much like that of the irritative type. When this picture is presented a careful examination should be made for pathological conditions. The authors observed an example of it in a case of transdiaphragmatic hernia of the left flexure of the colon.

ARTHUR GOSWAMI, M.D.

Weyll, L. B., and Wallace, H. L. Acute Appendicitis. *Edinburgh M J* 934 4 337

This article is a statistical analysis of 3,000 cases of acute appendicitis treated during the ten-year period from 1911 to 1921 at the Royal Infirmary, the Royal Hospital for Sick Children, and the Leith Hospital, Edinburgh.

The authors find that the number of cases of acute appendicitis admitted to hospitals has increased considerably during the past few years, but that the number requiring drainage has been steadily decreasing. While the mortality has probably fallen slightly during the past few years, it has remained constant during the past four years. The disease is more frequent and more serious in males than in females. The average age of greatest incidence is about nineteen years. The average general mortality is about 4.5 per cent. The mortality varies from 1 per cent in simple uncomplicated cases to between 27 and 30 per cent in cases of frank general peritonitis. Cases are now admitted to hospitals somewhat earlier than formerly. The death rate increases with the duration of the illness. Sixty-five per cent of the fatalities occur within one week and 83 per cent within two weeks. The mortality is definitely higher at the extremes of life. This is in agreement with the observation that the complicated cases are more common at these age periods. Of the complications, the respiratory diseases and postoperative obstruction have the highest mortality.

JOHN W. NURSE, M.D.

Gasteller, J., and Weiss, A. The Pathogenesis and Treatment of Proliferating and Stenosing Proctitis (Pathogénie et traitement des rectites proliférantes et sténosantes). *J de chir* 934 43 554

The authors divide cases of proctitis into (1) those with narrowing of the rectal lumen accompanied by ulceration, fistulae and abscesses; (2) those with similar changes accompanied by elephantiasis of the scrotum, labia majora, or perineum; (3) those

of proliferating proctitis before the stage of rectal stenosis; and (4) those of rectal narrowing before the development of the lesions of proctitis.

Of 331 cases in which an etiological study was made, the Wassermann reaction was positive in only 37 and of 74 cases in which careful search for the gonococcus was made, that organism was found in only 4. While tuberculosis must be considered among the possible causes of the condition and like the tubercle bacillus is occasionally found in the involved region, the authors call attention to the rarity of proliferating and stenosing proctitis in monsters for the treatment of tuberculosis. Dysentery and ulcerative proctocolitis may be pathogenic factors in some cases, but these cicatricial lesions are not considered in this report. In a series of rectal stenosis the authors isolated the streptothrix.

Of 43 cases of proliferating proctitis before the stage of diminution of the lumen, the Fried reaction was positive in 27, questionable in 3, and negative in 5. Of 555 cases with actual stenosis, it was positive in 233, negative in 13, and questionable in 9.

The authors present statistics based on 105 cases in which the rectum was removed and 5 in which colostomy was done. Of the former operative death occurred in 10, recurrence of the stricture in 72, recurrence of a suppurative proctitis in 9, improvement in 7, and cure in which the Fried test became negative in only 2.

In considering the pathogenesis of recurrence, the authors point out that the lesion is a perirectitis rather than a lesion like the rectal mucosa, and that therefore the so-called recurrence following amputation is in reality continuation of the process. They state that in cases of proliferating proctitis the lesion should be treated by general and specific therapy. For cases of stenosis mechanical dilatation is to be condemned as painful and dangerous. Diathermy will relieve the stenosis and reduce the secretions. However, this treatment also may be associated with danger. The authors report 3 fatalities from peritonitis and phlegmonous gangrene following this use. The value of irradiation is disputed. The authors recommend colostomy for amelioration of the symptoms, but emphasize that it will not prevent the progress of the disease. They state that when complications are present, colostomy should always be done and should be supplemented by such additional measures (drainage of abscesses, debridement) as the complications demand. In general the treatment of the disease should consist of conservative measures with the possible addition of colostomy.

WILLIAM C. BICK, M.D.

Bowling, H. H. and Frick, R. E. Primary Rectal Carcinoma under Radiation Treatment. A Statistical Review of 526 Cases. *Am J Roentgenol* 934 3 635

The authors present a statistical data based on 500 cases of carcinoma of the anus, rectum, and rectosigmoid seen early in their experience with radium and roentgen therapy at the Mayo Clinic. The

## SURGERY OF THE ABDOMEN

surgical and radiotherapeutic techniques employed in these cases were representative of the time that in cases of carcinoma of the rectum, anus, and rectosigmoid surgical intervention is most important and should be the first consideration. In some cases colostomy is essential. It should always be considered as a means of establishing a permanent or temporary opening. In selected cases, adequate irradiation treatment can be applied without colostomy. In every case an attempt should be made to estimate the grade of malignancy and then to decide on the plan of attack. Therapeutic irradiation, especially radium therapy, has a distinct place in the treatment of carcinoma of the rectum, anus, and rectosigmoid. Pre-operative radium therapy should receive special consideration and, when employed, should be followed by a period sufficiently long, probably from eight to twelve weeks, before surgical intervention is attempted. Radium therapy is of value also as a palliative procedure. In cases of inoperable and recurring lesions at least one well-planned radium treatment should be given. The degree of palliation varies, but nearly all patients will be benefited somewhat. Radium therapy as a postoperative measure has a limited field of usefulness, but should be employed at least for all lesions of a high grade of malignancy.

Roentgen therapy is of value, and with the increased voltage of the present-day installations, should become of greater value, especially in cases of lesions of the higher grades of malignancy. Since rectal polyps may undergo carcinomatous degeneration, adequate treatment or removal of these lesions may be classed as a procedure to prevent the occurrence of carcinoma of the rectum.

In conclusion the authors state that the combination of surgery, irradiation, and medical treatment should greatly reduce the surgical mortality and improve the immediate and late results.

**Hurst, A F** Anal Achalasia and Megacolon  
*Guy's Hosp Rep*, Lond, 1934, 84 317

The author has seen thirty-two cases of megacolon in private practice and eight in hospital practice. The condition is as common in adults as in children, but in adults it is found with about equal frequency in the two sexes whereas in children it occurs almost exclusively in boys. Although Hurst formerly believed that there is a sphincter at the pelvic rectal flexure, he is now convinced that no such structure exists. He states that under normal conditions faeces accumulate in the lower end of the pelvic colon and enter the rectum only immediately before defaecation. Like the rest of the alimentary tract, the pelvic colon, the rectum, and the internal sphincter of the anus have a double nerve supply. This is sympathetic from the second, third, and fourth lumbar ganglia and parasympathetic from the second, third, and fourth sacral roots. The author believes that the primary factor in the pathogenesis is usually achalasia of the sphincter ani—failure of

the sphincter relaxation which normally occurs with the arrival of peristaltic waves on their passage down the pelvic colon and rectum in the act of defaecation. The attempt to overcome the resistance offered by the closed anal sphincter produces increased peristaltic activity and gradual hypertrophy of the walls of the rectum and especially those of the pelvic colon. The distention of the pelvic colon results in an increase in its length as well as in its diameter. Sooner or later its upper extremity usually reaches the left dome of the diaphragm. Slight dilatation and hypertrophy are often present in a part or all of the rest of the colon. Without doubt, megacolon is caused by a disturbance in the normal balance between the sympathetic and parasympathetic nerve supply to the sphincter. The author believes that the disturbance of innervation results in underactivity of the parasympathetic, and that in most cases the parasympathetic deficiency is confined to the fibers supplying the anal sphincter. If, at the onset of dilatation of the pelvic colon in achalasia of the anal sphincter, the fold of mucous membrane at the pelvic rectal junction is unusually prominent, the dilatation of the immediately proximal part may exaggerate the link, producing a secondary obstruction. In some cases anal spasm may be associated with achalasia.

In the majority of the cases reviewed the sigmoidoscope could be passed its full length of 12 in without meeting resistance and endoscopic examination showed the end of the instrument in the center of an enormous cavity.

The diaphragm is pushed up by the dilated and elongated pelvic colon, and in young children the abdominal wall is pushed forward. The displacement of the left half of the diaphragm into what is normally part of the thoracic cavity simulates eventration of the diaphragm due to maldevelopment of its musculature, which is relatively less frequent. On roentgenological examination of the patient in the erect position before the administration of an opaque meal, the possibility of eventration of the diaphragm presents a striking appearance. The unusually high position of the left dome of the diaphragm presents a striking appearance. When a gas-containing cavity is seen under the right as well as under the left dome of the diaphragm the diagnosis of megacolon can be made. The exact anatomical condition present can be recognized only with the use of an opaque enema. Because of the considerable overlapping of the different segments of the bowel it is essential to watch while the fluid is being run in. The size of the colon after the enema is merely an indication of its distensibility. The opaque meal is of little diagnostic aid, but may be a valuable corrective of conclusions drawn from the findings made with the opaque enema. The small intestine is always normal, and in most cases there is little or no stasis up to the end of the iliac colon.

Megacolon is compatible with good health. The author deplors the growing tendency of surgeons

to perform a sympathectomy as soon as the diagnosis is made. It states that in most cases relief may be given by non-surgical means. It should be remembered that a colon which has been over-distended for any length of time remains permanently over-distended. The chief object in the treatment is to lessen the resistance offered to the passage of feces and gas by the closed anal sphincter. This can be done best by the introduction of a conical ebonny bougie every morning just after the first attempt to open the bowels. The bougie should be pushed in slowly as far as it will go without causing discomfort and left in position for half an hour. When attacks of pain and distention, presumably due to partial volvulus, recur in spite of treatment the passage of a flatus tube and, if necessary, the administration of morphia and atropine almost always give relief. In some cases the administration of morphia and atropine may be necessary in addition. Numerous reports of successful sympathectomy have been published, but it is still too early to say whether the results will be permanent. The author has not yet seen a case of megacolon in which he has found it necessary to advise sympathectomy but states that he would not hesitate to advise the operation if he had. One case in which sufficient improvement did not follow non-operative treatment

WALTER H. NASHLEY, M.D.

#### LIVER, GALL BLADDER, PANCREAS, AND SPLEEN

Hampson, A. G.: *Jaundice*. *Practitioner* 934. 31  
344

Hampson discusses jaundice on the basis of McEwen's simple classification of the condition into the hemolytic, toxic, infective, and obstructive types. It states that whereas well defined examples of each of these types are frequently encountered, combinations often occur. The value of the van den Bergh reaction in differentiating two types of bilirubin is discussed. It is emphasized that in every case of jaundice in which surgical procedures are deemed expedient great care should be taken in choosing the time for operation. When the jaundice is inconstant it is best to operate during a remission. When liver function is poor it should be improved as much as possible. The phenol-tetrastat iodophthalate test is suggested as probably the best criterion of liver function. The clotting time should be carefully studied and any delay should be treated. In hemolytic jaundice in which splenectomy may be indicated, transfusion may be of great value.

WALTER H. NASHLEY, M.D.

Fraser, F.: *The Behavior of Calcium in Bone After Total Exclusion of the Bile* (Sul comportamento del calcio nelle ossa dopo derivazione totale della bile). *Atti del 4° Congr. 1934* 3 786

The author reviews the literature and experimental evidence relating to the part played by bile in calcium metabolism, lipid metabolism, and the

acid-base equilibrium, calling attention particularly to the changes observed in bone by Doyen in 1900 and by other investigators subsequently.

He then reports the findings of his own study of the effect of exclusion of bile on the chemical constituents of bone. In experiments on ten dogs he excluded the bile by resection of the bile duct and cholecystectomy and at the same time removed a fragment of bone from the tenth left rib for chemical analysis. The intervention was followed after from two to five days by cholic stools, anorexia, thirst gradually increasing, belching, variable muscular weakness, marasmus, and loss of weight. Roentgenograms were made at monthly intervals. Death occurred after from thirteen to one hundred and twenty-six days. Four of the animals died within a month and the rest within from two to four months. At necropsy the animals were examined for gross skeletal changes and fragments of bone were again removed for chemical analysis.

Comparison of the findings of the chemical analysis of the bone removed during the intervention and of bone removed at necropsy revealed a diminution in the calcium content. The decrease in the calcium was in direct proportion to the length of the period of survival and was particularly marked in the animals that survived longer than six months. The organic matter was increased while the ash was decreased. No gross pathological changes were found in the skeleton at necropsy. The roentgen changes were marked only in the animal that survived one hundred and twenty-six days. In this animal there was a diffuse haziness throughout the bone shadows. A similar haziness was noted in the case of the dog which survived one hundred and fifteen days, but was less pronounced. As investigators who noted serious bone lesions and spontaneous fractures observed animals that survived from six to ten months, the author attributes the absence of marked bone changes in his animals to their short survival.

Tagliand concludes that complete exclusion of bile deprives the organism of an essential element, disturbs the acid base balance, hinders the absorption of calcium from the intestinal tract, and causes a process of decalcification. (Bone) CLARA RAYNE

Harding, H. E.: *The Secretion of Mucous by the Epithelial Cells of the Gall Bladder and the Experimental Production of Mucocoele*. *Ann. Surg.* 1934 3 355

The mucosa of the gall bladder has a single layer of large columnar or prismatic cells throwing late folds of varying height according to the degree of distention of the organ. There are no essential differences in the appearances of the cells in man, cats, dogs, goats, sheep, pigs, or guinea pigs. The individual cells vary considerably in shape and intensity of staining according to their functional phase but in the normal epithelium there is only one type of cell. Until the cytoplasm is loaded granules of mucous staining brightly with

# SURGERY OF THE ABDOMEN

mucicarmine These vary greatly in number in different gall bladders and different parts of the same organ, but are always present in normal tissue. It is suggested that they are formed in the region of the Golgi body.

It appears probable that in the production of a mucocele of the gall bladder in man several factors play a part, viz (1) obstruction, commonly by a stone, (2) absorption of the bile contained in the vesicle, or its expulsion by a mucous secretion before obstruction is complete, and (3) a mild continued inflammation, probably bacterial but with organisms of a virulence too low to produce a purulent reaction. This conclusion agrees with that reported by Illingworth and Dick in 1932.

GEORGE A COLLETT M D

Short, A R, and Paul, R G Torsion of the Gall Bladder *Brit J Surg*, 1934, 22 301

The authors report three cases of acute torsion of the gall bladder and give briefly the histories of fifty cases collected from the literature. They state that the condition occurs most often in elderly females. It is characterized by acute pain and vomiting followed within a short time by marked enlargement of the gall bladder which renders that organ palpable. The palpable mass appears and disappears.

The torsion is favored by the presence of a mesentery or short attachment of the gall bladder. In the authors' three cases only the cystic duct and neck seemed to be attached to the liver. The body and fundus were free. The authors suggest that the normal peristalsis of the transverse colon might cause such torsion by carrying the gall bladder in an anti clockwise direction. They cite the great frequency of torsion in an anti clockwise direction in the reviewed cases. Gall stones are apparently not an important factor.

As treatment, the authors advise early cholecystectomy. In the thirty-nine reviewed cases in which the results of operation were reported there were five deaths.

ROBERT ZOLLINGER, M D

Mackey, W A Cholecystitis Without Stone *Brit J Surg*, 1934, 22 274

In a review of the literature Mackey found that, according to the experience of a large number of surgeons, cure or improvement can be expected after cholecystectomy in nearly 90 per cent of cases of cholelithiasis and in more than 80 per cent of cases of cholecystitis without stones.

He concludes that the majority of surgeons have come to regard biliary colic as a symptom which definitely implicates the gall bladder and to believe that if colic has occurred a satisfactory outcome from cholecystectomy is practically assured. In fact, in the estimation of the prognosis this symptom has come to be considered of greater importance than the pathological changes that may be present in the gall bladder.

In order to formulate an opinion on these problems Mackey critically reviewed 243 cases of cholecystitis without stones and 21 cases of cholelithiasis of the gall bladder with stones in which cholecystectomy was performed during the ten year period from 1922 to 1931. Follow-up studies were made carefully, and all of the pathological material was re examined.

From his findings Mackey concludes that in cases of cholecystitis without stones cholecystectomy has a mortality of 3 per cent, cures the symptoms in 30 per cent of the cases, results in improvement in 30 per cent, and is followed by unsatisfactory end results in 37 per cent. He states that no single test is infallible, but in the individual case a study of the clinical history, of the cholecystogram, and of the microscopic sections may each yield information pointing toward or away from the gall bladder. To establish a diagnosis of cholecystitis the history must be typical and include pain, and the cholecystographic changes must be definite. Microscopic changes are probably not significant unless they are fairly gross.

In the individual case the results of surgical treatment of cholecystitis without stones are relatively unpredictable even by the most modern laboratory procedures. It is certain, however, that they will not be so good as those obtained in the presence of gross organic disease, in which, as a rule, the symptoms are clamant and the relief after operation is dramatic.

EARL GARSIDE, M D

Patey, D H The Experimental Production of Cholesterosis (Strawberry) Gall Bladder *Brit J Surg*, 1934, 22 378

In experiments on rabbits the blood cholesterol was raised by feeding cholesterol and at the same time attempts were made to produce inflammatory changes in the wall of the gall bladder by pinching the organ with forceps, puncturing it with a hypodermic needle, ligating the cystic duct, or injecting short chained streptococci intravenously. Later, sections of the gall bladders were stained with Sudan III and examined with the polarizing microscope.

In the animals in which the inflammatory reaction was confined to the serosa, the deposits of cholesterol were also limited to the serosa. Deposits of cholesterol similar to those in the chronically inflamed gall bladder were found also in other chronically inflamed regions such as the surgical incision of the abdominal wall and adhesions about the gall bladder. Ligature of the cystic duct before the feeding of cholesterol did not prevent the deposition of cholesterol in the inflamed gall bladder. The content of cholesterol in the blood was always higher than the content of cholesterol in the bile.

The author concluded that in the hypercholesterolized rabbit cholesterol is apt to be deposited in the chronically inflamed gall bladder from the blood. His findings are against Illingworth's conclusion that the cholesterol comes from the bile and

is deposited because of a breakdown of the normal absorptive mechanism. Patey believes there is little evidence to support the theory that cholesterosis is due to a breakdown in a normal cholesterol-secreting mechanism.

The findings in the experiments reported suggested no relationship between the cholesterolosis of gall bladder and gall stones.

In discussing the application of his experimental findings to man, Patey says that if the cholesterolosis of gall bladder represents merely the deposition of cholesterol from the blood, then, provided the functional tests of the gall bladder are satisfactory and the organ appears normal, there is no more indication for cholecystectomy on account of the condition *per se* than for the removal of any other xanthomatous area.

CARL O. LAMORE, M.D.

Maschotte, R. L., and Chiles, R. V. Acute Oedematous Pancreatitis (La pancreatitis aguda edematosa). *Rev med-quimica de pais jamaica*, 9:4, 193.

The acute oedematous pancreatitis described by Zoepfel, Broca, and Courvelaire is an affection of the pancreas characterized by an acute oedematous infiltration—generally diffuse—of that organ with involvement of the adjacent peritoneum. It presents a definite clinical picture. The authors who have had an opportunity to study three cases of the condition, compare their findings with those in sixty nine cases collected from the literature. They report their cases in detail, including the laboratory, roentgenological, and operative findings.

Patients with acute oedematous pancreatitis often give a history of "hepatic colic" or dyspepsia, but the onset of the disease is acute with severe, steady general pain in the abdomen which sometimes is most marked on the right side and is often accompanied by vomiting. The vomitus may be bile stained. The acute attack may subside, but as a

rule a hemorrhagic pancreatitis develops. Sometimes there is slight fever. Jaundice is present in varying degree. There is usually diarrhoea. Prostration, even shock, may result. The abdomen is tense, rigid, and often distended. On deep palpation, especially in the right upper quadrant, it is spastic. Tests of the function of the pancreas are inconclusive. Roentgen signs of pancreatitis—an angulation and displacement of the duodenum—have been described by Roemer.

That the clinical picture may vary decidedly is evidenced by cases cited from the literature. A pre-operative diagnosis is often impossible. The nature of the condition may not be recognized even at operation unless the surgeon bears the possibility of the disease in mind. The etiopathogenesis is obscure. Laboratory experiments have yielded indefinite or contradictory results. From the standpoint of the prognosis three forms are to be distinguished: (1) a subacute intermittent type, (2) an acute type with a violent onset, and (3) a suppurative type with a very grave outlook.

The treatment indicated is surgical and should be directed primarily to the biliary tract. As a rule it is cholecystectomy. In the postoperative treatment the sugar, chlorides, and urea of the blood should be checked up. EUGENE T. LEECH, M.D.

JAMES, R. M.: Pancreatic Fistula. Report of a Case: Cure by Pancreatogastrostomy. *Bull J Surg*, 9:4, 196.

James reports a case of pancreatic fistula which followed operation for acute hemorrhagic pancreatitis. After the fistula had discharged for six months, drainage became slight and a pancreatic cyst formed. At second operation the cyst was marsupialized. The fistula thus formed continued to drain about 15 cc. of clear fluid daily. At a third operation the fistula was implanted into the stomach. Complete recovery resulted.

EARL GARRICK, M.D.

## UTERUS

**Bonney, V** The Principles That Should Underlie All Operations for Prolapse *J Obst & Gynec Brit Emp*, 1934, 41 669

The author precedes a discussion of the different types of prolapse by a detailed description of the supporting mechanism of the vagina. He states that there is a constant tendency for the vagina to evert when the intra-abdominal pressure rises above the atmospheric pressure, but that under normal conditions there are several factors which hinder eversion or prolapse. Prolapse denotes failure of some or all of the factors in the protective mechanism.

For successful results in the treatment of prolapse the surgeon must ascertain before undertaking the operation which portion of the supporting mechanism has failed. No one operation is applicable to all types of prolapse. Every operation for the condition should have as its object the restoration of the part of the sustaining mechanism of the vagina which is at fault.

HENRY S. ACKEN, JR., M.D.

**Frankl, O** The Mucosal Vessels of the Bleeding Uterus (Über die Schleimhautgefäße der blutenden Gebärmutter) *Wien klin Wchnschr*, 1934, 2 838

We know today that the changes in the mucosa of the uterus take place under the influence of two hormones, folliculin in the first half of the cycle, and progesterin or luteohormone in the second half. As secretion processes occur in the uterine glands even in the first phase, the author suggests the designation "evolutionary stage" for the first phase and "transformation stage" (Clauberg) for the second phase. In the second phase three layers may be differentiated in the mucosa, the basalis with narrow inactive glands, and the functionalis of Schroeder which is divided into two layers, the prædeciduale compacta on the surface through which only the excretory ducts of the glands pass and, beneath, the spongiosa. The blood vessels of the mucosa show cyclic changes paralleling those occurring in the glands. In the beginning of the evolutionary stage the mucosa is poor in vessels and its vessels are narrow and thin walled. Even at the end of this stage its vascular supply is not very rich. However, under the effect of the luteohormone a progressive increase of vascularization occurs so that at the end of the transformation stage numerous very wide vessels similar to those of the glands are present. The transformation is therefore not the result of hyperæmia, but due solely to the effect of the progesterin. The physiological progress of this vascular cycle may be disturbed by ovarian disharmonies, disturbances of the general circulation, local mechan-

ical influences (such as may be caused by the pressure effect of benign tumors), inflammatory, degenerative and destructive processes, and by constitutional peculiarities. In addition to persistence of the follicle, sudden incomplete ripening of the follicle may cause a hyperplasia.

The vessels of the hyperplastic mucosa are extraordinarily numerous and very wide. They run irregularly and are not vertical to the epithelium. The vascular changes may be the only sign of the disturbance in hormone production. As they may lead to thromboses and necroses they may also cause hæmorrhages. Therefore the hyperæmia associated with hyperplasia of the mucosa is never the cause of the mucosal changes but is the result of an excess of folliculin in the absence of luteohormone. In cases of myoma also, the mucosal vessels are enormously dilated and may develop into the form of blood sinuses. The vessels of polyps usually have thick walls and wide lumina. In adenomyosis the vessels are enormously dilated, show an irregular arrangement with spiral windings, and have thickened walls. During the puerperium there may be considerable bleeding from widened vessels in retained islands of the decidua. Uterine hæmorrhages which are so frequent and sometimes not easy to understand demand a closer study of the blood vessels of the uterine mucosa than has been made to date.

(FROMMOLT) JOHN W. BRENNAN, M.D.

**Cotte, G., and Mathieu, J.** Cases of Spontaneous Phlebitis Occurring During the Course of Development of Uterine Myomata (Quelques cas de phlébites spontanées au cours de l'évolution des myomes utérins) *Gynec et obst*, 1934, 30 209

The authors discuss only phlebitis developing in cases of uterine myoma before the institution of treatment. This type is quite rare. Although in most cases the myoma has already become manifested by hæmorrhage or other signs, in other cases the phlebitis is the first sign. The authors report four cases of the latter type. In three of them the phlebitis was very evidently due to infection. In one of the latter it developed during an attack of pulmonary congestion. In the two others the myoma was of the anæmic type and the bleeding resembled the secondary hæmorrhages occurring in infected wounds. In a case with urinary disturbances the colon bacillus was found in the urine and it was probable that, as in certain cases of postoperative phlebitis, the infection was of intestinal origin.

The authors have seen only five cases of the type described in a period of fifteen years and believe that the present-day use of physiotherapy in cases of metrorrhagia and the early performance of myomectomy will probably decrease their incidence.



In none of the cases reviewed was the tumor large enough to cause compression. In spite of immediate immobilization, the application of leeches, vacuotherapy and the use of all other known remedies, the phlebitis in all of the cases moved from one side to the other and in one case it involved even the upper limb.

Phlebitis due to compression occurs in cases of large fibromata and produces more or less marked venous distention on the surface of the involved limb. It is characterized by rapid edema, absence of fever, and only slight pain. Palpation reveals a hard cord along the course of the saphenous or femoral vein, which is evidence of venous obliteration.

The phlebitis of infection, on the other hand, may involve any vein of the body. It develops suddenly with severe pain and fever. Suppuration may occur if the bacterium is sufficiently virulent.

Because of the danger of embolism, most surgeons believe that in cases of phlebitis due to compression it is best to delay intervention until the phlebitis has subsided. For cases of phlebitis due to infection they recommend immediate removal of the myoma because the tumor is usually necrotic and the risk of thrombosis becomes greater with delay. As the infection causing infectious phlebitis is so frequently of intestinal or urinary origin, Cotte and Mathien believe that immediate operation for removal of the myoma would not have a beneficial effect upon it and that therefore, in cases of infectious phlebitis as well as those of phlebitis due to compression, operation should be delayed until the phlebitis has subsided. A delay of forty days has been suggested, but in some cases it may be necessary to operate much earlier and in others to delay longer. Operation is indicated as soon as the phlebitis has subsided and embolism is no longer to be feared. The temperature, blood picture, and sedimentation rate should be used as guides.

In emergency cases, such as those of gangrenous myomas, it might be advisable to ligate the hypogastric veins before removing the tumor.

EDITH SCHRAMME MOORE

Westerdal, P. Does the Microscopical Diagnosis Afford Pragmatical Guidance in Cervical Cancer? *Acta obst. et gynec. Scand.* 934, 24, 305.

At Radhusthemmet, Stockholm, the relation between the histological appearance of a cancer and the results of radium treatment as judged from observation over a period of five years was studied in 354 cases of solid cancer of the cervix. The cancers were classified histologically into 3 groups: (1) mature keratinous cancers, (2) more typical cancers without keratinous formation, and (3) immature anaplastic cancers. Clinically the cases were divided into four groups according to the classification proposed by the Cancer Commission of the League of Nations.

The incidence of healing was so nearly the same in the 3 histological groups as to indicate that the macroscopic appearance of the cancer is of no im-

portance in the prognosis of irradiation treatment. Kammler made the same observation with regard to treatment by surgery alone and treatment by surgery combined with irradiation.

The author concludes that the histological picture in cervical cancer is of no aid in the prognosis and does not indicate whether operation or irradiation is to be preferred in a given case.

Frommolt, G., and Wastinger, K. The Prognosis of Carcinoma of the Portio in the Young (Zur Prognose des Portiocarcinoms bei Jugendlichen). *Zentralbl. f. Gynäk.* 934, p. 305.

Because of the unfavorable results obtained in recent years in the treatment of carcinoma of the portio in women under thirty years of age, the authors reviewed the carcinoma material of the Berlin University Gynecological Clinic from 91 to date. It is found that the incidence of carcinoma of the portio in young women varied considerably in this period of twenty-three years. Of the 100 cases, five-year cure was obtained in 43 (53 per cent). As the method of treatment was frequently changed during the period reviewed, the cases are divided into 3 groups.

Of 36 patients who were treated in the period from 9 to 1918, 16.7 per cent remained cured for at least five years. Of 35 patients in this group who were subjected to the Wertheim operation, 33.3 per cent were cured permanently. In cases treated in the period from 1913 to 1919 which were reviewed by Philipp and Goralick, the incidence of immediate cure from operation was 45 per cent, and the incidence of absolute cure, 50.7 per cent.

Of the cases of the authors' series which were treated in the period from 1919 to 1935, permanent cure was obtained in 33.3 per cent. After surgery the incidence of permanent cure was 47.8 per cent, whereas after irradiation it was only 16.7 per cent.

In the cases treated since 1916, period in which radical operation by way of the vagina was substituted for the Wertheim operation, surgery was followed by twice as many permanent cures as irradiation.

The authors conclude that in cases of carcinoma of the portio in women under thirty years of age the prognosis is definitely more unfavorable than in older women and that treatment by surgery is superior to treatment by irradiation. No increase in the incidence of carcinoma of the portio in young women could be established.

(FACONCZ) MARTIN J. SEITZ, M.D.

Calhoun, C. E. Schiller's Test for Early Squamous-Cell Carcinoma of the Cervix. *Am. J. Surg.* 934, 86, 881.

Present-day treatment of cancer of the cervix is most efficacious when the growth is in the early stages. Consequently any method of investigation which permits an early diagnosis is worthy of trial.

Schiller's iodine test is advocated as an office procedure to demonstrate glycogen free areas on the

cervix It consists in gentle painting of the cervix with Gram's solution (iodine 1 gm., potassium iodide 2 gm., and water 300 c. cm.) It is simple and painless, it requires no expensive apparatus, and it consumes little time. Tissue for study should be taken, if possible, from the margin of an iodine-free area.

Only about 20 per cent of the iodine-free areas will prove to be cancerous, but the continued use of the Schiller test will stimulate more careful inspection of the uterine cervix and should materially increase the examiner's diagnostic acumen in recognizing very early asymptomatic carcinomata.

GEORGE H. GARDNER, M.D.

Puccioni, L. Leucoplakia and Cancer of the Cervix (Leucoplachia e cancro della portio). *Riv Ital di ginec.*, 1934, 16 25

Puccioni discusses the relationship of leucoplakia to cancer and reports three cases of cervical leucoplakia in which the cervix was amputated and the lesions were studied histologically. He states that in the diagnosis of lesions of the cervix he uses the colposcope and often notes areas of leucoplakia which might be easily overlooked in examination with the speculum. He accepts Hinselmann's classification of leucoplakia of the cervix. He describes three types: (1) plaques which are whitish, more or less superficial, usually quadrangular or triangular, rarely circular, and often multiple; (2) plaques with a base which appears grayish-red because of the intermingling of numerous white and red punctate areas; and (3) plaques composed of grayish-white quadrangular forms separated from one another by a red ring.

Histologically, he differentiates four types. Type 1 is characterized by cornification of the superficial layer of the epithelium and the appearance of atypical epithelial elements, especially in the deeper layers. Type 2 shows, in addition to the epithelial changes seen in Type 1, a distinct tendency toward deepening of the epithelial papillae into the subjacent connective tissue and around the glands. Type 3 is characterized by many atypical cells. In Type 4, the cells are frankly neoplastic.

Following a review of the literature on the relation between leucoplakia and cancer, the author concludes that not infrequently plaques of leucoplakia may develop into carcinoma and that therefore early diagnosis and removal of areas of leucoplakia are important in the diagnosis and prevention of carcinoma of the cervix.

In discussing the etiology of leucoplakia of the cervix, he attaches great importance to chronic inflammatory processes or irritative lesions of the genital tract. He calls attention to the fact that most women with leucoplakia have had leucorrhœa for a long time and show lacerations, ectropions, or erosions of the cervix. The areas of leucoplakia seen through the colposcope are usually found along the margins of an ectropion or erosion.

The cervical area involved by leucoplakia should be excised and the plaque of tissue examined micro-

scopically. The tissue changes seen microscopically determine whether the treatment should be amputation of the cervix or total hysterectomy. Only very early lesions may be treated conservatively with examination at frequent intervals.

PETER A. ROST, M.D.

Taussig, F. J. Iliac Lymphadenectomy with Irradiation in the Treatment of Cancer of the Cervix. *Am J Obst & Gynec.*, 1934, 28 650

Iliac lymphadenectomy has been performed by the author in twenty-six cases of cancers of Groups 2 and 3.

Under spinal anesthesia a midline incision was made. After simple ligation and removal of the right adnexa, the posterior sheath of the broad ligament on that side was caught with a clamp and the ligament opened up with exposure of the ureter coursing over the pelvic brim and attached to the posterior sheath. It was then possible to see the bifurcation of the common iliac vessels into the external and internal iliac branches and, in the angle between these vessels, the iliac lymph gland, the most common site of metastasis of cancer of the cervix. With a little experience in lymph-gland palpation and dissection it became a relatively simple matter to free this gland and lift it up so that the small nutrient vein could be caught and ligated. The obturator gland was then removed. If the parametrium was not thickened too much, it was possible to follow the ureter down to where it crossed the uterine artery. Here the ureteral glands (Championnier) were located and removed. The removal of these glands was more difficult as it was necessary to avoid injury to the ureter. Removal of these glands often required ligation of the uterine vessels. Occasionally the glands were surrounded by exudate to such an extent as to make their removal inadvisable. This was true in two out of seven of the cases. In such instances radium emanation seeds were implanted into the lymph gland.

The relative infrequency of involvement of the sacral glands, the variation in the location of these glands back of the rectum, and the necessity for extensive deep dissection to effect their removal led the author to refrain from including them in the operative procedures. Hence, instead of removing them, he implanted two gold radon seeds of 1½ mc. each with a trocar along the course of the sacro-uterine ligaments and a third radon seed of equal strength in the loose connective tissue of the iliac bifurcation. In order to prevent the formation of a hæmatoma in the broad ligament, the connective tissue space that had been opened up was compressed by suturing the round and sacro-uterine ligaments to each other at a distance of 4 or 5 cm. from their uterine insertion. The remaining wound was closed by a running peritoneal suture. The same procedure was then carried out on the other side. The abdomen was closed without drainage. The operation was usually followed by an intracervical application of radium.

## INTERNATIONAL ABSTRACT OF SURGERY

In sixteen of the twenty-three cases preliminary irradiation with the X rays or by the intracervical cases radium or radon seeds was given. In all but two of the lymph-gland resection (radon seeds in both radon seeds and radium in three cases, and X ray treatment given usually on four days over a period of ten days) and totaling 600 m.e.-cm., equivalent to 814 r units, was employed in thirteen cases. The lowest dose of radium, .600 mgm hr treatment was given in the case of a patient with incomplete highest dose, 8.75 mgm hr was given when recurrence was resorted to for recurrence. The average dose maintained in almost every case was 4.50 mgm hr.

In the less advanced cases there was one operative death, a mortality of 5.5 per cent, while in the far advanced cases there was 3 deaths, mortality of 37.5 per cent.

The prognosis is rather encouraging in cases of Group 3, but discouraging in those of Group 4. Of sixteen patients with a cancer belonging to Group 3, one died after operation, five died of recurrence from twelve to twenty-one months after operation (twelve are living (one with a probable recurrence) and eleven have been clinically well for periods ranging from four months to three and one-half years. Eighty-five lymph glands were removed in the eleven cases. Nineteen glands showed carcinoma. Of the twenty-six patients, cancer was found in the removed lymph glands of twelve (46.1 per cent). These lymphadenectomy is recommended for patients who are in good physical condition and not obese, who have tumors not markedly radiosensitive and involvement of the parametria not extending all the way to the pelvic wall, and, preferably for those who are young.

EDWARD L. COCKELL, M.D.

Tudhope, G. R., and Chicheborn, A. E. On the So-Called Sarcoma of the Endometrium. *J Obst & Gynec Brit Emp* 934, 4, 708.

During the past few years the group of neoplasms classified as sarcoma has been reduced by the exclusion of a number of new-growths the epithelial origin of which is now recognized. Examples of the latter are the neuroblastomas of the suprarenal glands and highly cellular tumors of the thyroid, lungs, and testicles which can now be classified as alveolar adenocarcinomas.

The authors describe three types of tumors all of which were removed after the menopause. The patients presented a symmetrical enlargement of the uterus due to the presence of an ovoid or pear-shaped tumor arising from the endometrium. On section, the growths had an opaque grayish-yellow color and were homogeneous in appearance except for small areas of hemorrhage and necrosis. None of the uteri contained fibroids, and there was nothing to suggest that the new-growths had arisen from either polypoid fibroid or the myometrium. The tumors

appeared to be expanded and stretched rather than invaded by the tumor. In two cases the tumor was quite sharply demarcated from the adjacent muscle by a zone of loose connective tissue. On microscopic examination the neoplasms did not resemble myosarcomata, but strongly suggested diffuse medullary carcinomata. In one case frankly adenocarcinomatous patterns are found in areas which on casual study suggested sarcoma. In the two other cases numerous multinucleated giant cells were observed in addition to the diffuse spindle and round cell structure.

Many reported cases of carcinosarcoma of the uterus were reviewed. The authors believe that some of the tumors in these cases were cellular carcinomata.

The relation of the neoplastic cells to the stroma is essentially different in sarcoma and carcinoma. In sarcoma, the relation of the reticulum to the tumor cells is intimate and constant, the fibrous form delicate supporting stroma which penetrates between the individual cells of the tumor. In carcinoma, the reticulum is pushed aside by the expansive growth of the cancer cells and a new reticulum is formed solely by cells of the vascular stroma between the groups of epithelial elements. The architecture of the three tumors reported was studied after the reticulum had been demonstrated by silver impregnation. In each instance the pattern of the reticulum favored the view that the tumors were of an epithelial nature. Consequently the neoplasms were classified as diffuse endometrial carcinomata.

GEORGE H. GARDNER, M.D.

Moskowitz, P., and De Langra, M. Sarcomata of the Body of the Uterus (Sarcomas du corps de l'uterus). *Gynecologic* 934, 33, 418.

Although sarcoma of the uterus is rare, constituting only about 1 per cent of uterine tumors, the authors have seen three cases in a period of less than two years. They report these cases in detail.

The first case was that of a woman forty-three years of age who entered the hospital for treatment of abdominal pain which was most severe on the left side and metrorrhagia. On pelvic examination the uterus was found enlarged to the size of two fists, regular and globular in form, and movable. The patient had a temperature between 38.5 and 39.6 degrees C due to thrombophlebitis of the left leg. An abdominal total hysterectomy as performed. The tumor was found to have had its origin in the cavity of the uterus. Histological examination showed it to be an alveolar non-differentiated sarcoma. The patient died three months after the operation from metastases to the lungs.

The second case was that of a woman forty-six years old, the mother of six children. The youngest child was seventeen years of age. The patient complained of menorrhagia, metrorrhagia, and pain in the right leg. Pelvic examination revealed fibroid areas extending beyond the umbilicus. The uterus

## GYNECOLOGY

was round and regular in form and movable. Because of the rapid development of the tumor, malignancy was suspected. Total hysterectomy and appendectomy were performed. Histological examination showed the tumor to be a leiomyosarcoma. The patient is now in excellent health.

The third case was that of a very obese woman sixty six years old who had passed the menopause sixteen years previously and had had a serous vaginal discharge for several months. Pelvic examination disclosed a resistant abdominal tumor with some degree of fluctuation which was situated mainly to the left of the midline. A diagnosis of polycystic tumor of the ovary was made and subtotal hysterectomy was done. The tumor was found to be sarcomatous and of uterine origin. An unusual feature was its cystic consistency. During the operation it was punctured with a trocar and more than 1 liter of bloody fluid was aspirated. The patient died two months after the operation from a pleuropulmonary metastasis.

In discussing these cases the authors compare them with twenty three cases collected from the literature. They state that the possibility of uterine sarcoma should be considered in all cases of metrorrhagia or abdominal pain associated with a rapid increase in the size of the abdomen due to a tumor with the characteristics of a fibroma. In such cases hysterectomy is the safest procedure. For inoperable cases of uterine sarcoma the authors recommend radiotherapy. They call attention to the fact that in two of their three cases the condition was accompanied by fever and phlebitis which are not common complications of uterine fibroids.

ISAAC ANDERSTADT, M.D.

## ADNEAL AND PERIUTERINE CONDITIONS

Fluhmann, C. F. The Nature of Ovary-Stimulating Hormones. *Am J Obst & Gynec* 1934 28 668

A comparison of the biological characteristics of a number of gonad stimulating hormones was made by (1) an analysis of the histological changes induced in the ovaries of immature rats, (2) a comparison of the effect on the weight of the ovaries of a known total dose of an extract given over periods of five and ten days, and (3) a study of the histological changes in the ovaries of hypophysectomized rats.

It was found that the extracts could be divided into the two following main groups (1) an "anterior pituitary group," which included preparations made from human hypophyseal material and the urine of women in the postclimacteric period and (2) a "chorionic hormone group," which included extracts prepared from the blood or urine of normal pregnant women, the urine of a woman with a chorionepithelioma of the uterus, and the urine of a man with a teratoma of the testicle.

The possible rôle of the "chorionic ovary stimulating hormone" in the physiology of human gestation is discussed.

EDWARD L. CORNELL, M.D.

Jeffcoate, T. N. A., and Potter, A. L. Endometriosis as a Manifestation of Ovarian Dysfunction. *J Obst & Gynec Brit Emp*, 1934 41 684

Without considering the origin of the initial endometrial elements in endometriomatous lesions the authors express the opinion that the subsequent development of such lesions depends upon over activity of the portion of the ovary secreting the follicular hormone. In the majority of the 111 cases of endometriosis which they studied the presence of such overactivity was demonstrated by examination of either the ovary or the endometrium of the uterus. In only a few instances was there a demonstrable corpus luteum or any evidence in the endometrium of the action of the corpus luteum whatever the time of the menstrual cycle. The incidence of sterility was extremely high. From their studies the authors conclude also that the overgrowth of fibromuscular tissue frequently associated with endometriosis may be due to overactivity of the ovary in the production of the follicular hormone.

HENRY S. ACKER, JR., M.D.

## MISCELLANEOUS

Bucura, C. Guides with Regard to the Clinical Aspects of Gonorrhoea in the Female (Image Richtlinien zur Klinik der weiblichen Gonorrhoe) *Med Klin*, 1934, 2 113, 1148

Bucura first discusses the various methods used for the diagnosis of gonorrhoea, especially the microscopic examination of slides stained with Gram's stain. He then discusses the significance of the complement fixation reaction in gonorrhoea. He states that the serum reaction is definitely positive only after the gonococci have reached the deeper tissue layers. In every case it is at first negative. As a rule the body requires from two to three weeks to become seropositive even when the infection involves the deep structures.

The result of the serum reaction is of special importance in the determination of the treatment. In the acute stage the chief object of treatment should be to strengthen the body's resistance to the organisms. Of chief importance, therefore, are rest and a proper position of the body to favor drainage of the secretion.

Actual treatment is not begun until the chronic stage is reached, that is, the transition from the acute to the chronic stage. The author discusses the nature and importance of local treatment with particular reference to the excellent results obtained by vaccine therapy. He states that the injection of vaccine should be given in the immediate site of infection. Vaccine treatment is contra indicated by extensive active lung conditions, severe cardiac injuries, and other severe affections of internal organs. Detailed instructions regarding the dosage of vaccine are given.

Bucura next discusses the indications for surgical intervention, but emphasizes that as a rule gonorrhoea can be cured by conservative methods. He

states that the earlier the treatment is begun the more complete the cure, and the later it is begun the greater the probability of residual functional disturbances (L. WALTERS). *MATTHIAS J. SCHEPPE, M.D.*

**Packalen, T.** Studies on the Gonorrhea: Its Specificity and Its Behavior in Prostitutes. *Acta Soc. med. Fennica Duodecim*, 1934, 7, Fasc. No. 2.

The author proceeds a discussion of the results he has obtained with the Kristiansen technique for the gonorrhea (gonococcal complement fixation reaction) by a lengthy and detailed review of the literature on this reaction. He states that the reports in the literature concerning the reliability of this test are at great variance, the reported accuracy in bacteriologically proved cases of gonococcal urethritis ranging from 74.49 per cent (Meermeester and Zeude) to 19 and 2.3 per cent (Freudenthal and Heymann).

Packalen carried out 3,173 serum tests on 3 large groups of persons: (1) 953 non-prostitutes, and (2) 675 prostitutes. These included patients with bacteriologically proved gonorrhea, patients with arthritis and arthritis not bacteriologically proved to be gonorrheal, and 610 persons used as controls.

The chief results of the tests are summarized as follows:

Of 34 persons with proved gonorrhea, 84.4 per cent showed a definitely positive reaction, 7 per cent a weakly positive reaction, and 8.4 per cent a negative reaction.

The incidence of positive reactions was highest in cases of arthritis and inflammation of the female adnexa. In the former it was 93.2 per cent and in the latter 9.7 per cent.

Of 44 cases of gonorrhea limited to the mucous membrane, the reaction was positive in 65.9 per cent.

Of 40 apparently healthy persons subjected to the test, 5 (12.5 per cent) showed positive reaction. Of 133 patients with various diagnoses except gonorrhea, 8 per cent reacted positively as did 7.4 per cent of 7 pregnant or aborting women and 2.4 per cent of 197 patients with pulmonary tuberculosis without clinical evidence of gonorrhea.

5. In the cases of 585 prostitutes who had or had had bacteriologically proved gonorrhea the incidence of positive reaction ranged from 65.5 to 89.6 per cent. In the cases of 346 prostitutes with acute or very recently acute gonorrhea it ranged from 8.3 to 89.6 per cent and in the cases of 239 prostitutes without bacteriological evidence of gonorrhea it ranged 65.5 to 84.5 per cent.

6. Of 59 women who had been prostitutes for from six months to two years, almost 90 per cent showed a positive gonorrhea although bacteriological proof of gonococcal infection was found in only 40.9 per cent. In the cases of 35 women who had been prostitutes for more than two years, the incidence of positive reactions was 75 per cent.

The author concludes from these findings that while the presence of acute gonorrhea can be proved in a high percentage of cases both bacteriologically

and serologically chronic gonorrheal infection is detected about 3 times more often by serological than by bacteriological study. He believes that if in the cases of prostitutes the gonorrhea were used as a continuous control in addition to regular bacteriological examinations it would make possible more effective supervision and control of these infected and potentially infected women.

*HAROLD C. MACK, M.D.*

**Mittroff, E.** A Study of Appendicitis in Gynecology. *J. of Obst. & Gynec.* 1934, 7, 191.

The author believes that there is a close relation between appendicitis and inflammation of the internal female genitalia and that therefore, whenever appendicitis occurs in a woman of marriageable age, the appendix should be removed however slight the attack. It is of the opinion also that in general laparotomies on women the internal genitalia and the appendix should be examined carefully and appendectomy should be done as a precautionary measure even if the appendix shows no morbid changes.

*J. THOMAS WYNN, M.D.*

**Caccagna, O.** Experimental Investigations Regarding the Relationship Between the Thyroid Gland and the Central Organs of Immature Female Rabbits Treated with Pregnancy Hormones (*Ricerche sperimentali intorno alla correlazione fra tonsolo ed apparato genitale femminile di conigli immaturi trattati con ormoni gravidanzaali*). *Riv. sci. di med.*, 1934, 15, 639.

In the literature reviewed by the author there is considerable controversy regarding the relationship between the thyroid gland and the genital organs.

Friedlöh, Hammar, Canaldi, Rancos, and others differ regarding the exact weight of the thyroid at various times of life but agree that the gland is large in prenatal life, diminishes during the first and second years, increases again between the fifteenth and twentieth years, regresses gradually after the twentieth year until about the sixty-fifth year and then again increases slightly.

A number of investigators have reported hypertrophy of the male gonads in young animals following thyroidectomy and hypertrophy of the thyroid following castration. Others (among them Henderson, Knipping, and Gellin) have noted a marked retardation of the physiological involution of the thyroid after irradiation of the testicles or castration. Ranz and Tandler found retardation of the development of the sex glands of animals after prolonged administration of thyroid extract. In females, Lucien and Parriot found the ovaries smaller than in the controls, the graafian follicles near the surface of the ovary less prominent, and the maturation of these cells more or less retarded although reproductive capacity did not appear to be altered. Other investigators report an increased incidence of atretic follicles and an increase in the interstitial tissue and the lipid substances.

## GYNECOLOGY

The author studied the action of the pregnancy hormones on the thymus of immature animals. He selected rabbits from sixty to eighty days old which weighed from 650 to 750 gm. He divided them into 5 groups of 3 rabbits each. The first group were given injections of urine from women in the fourth or fifth month of pregnancy, the second group, injections of urine from women at term, the third group, "boiled" urine of women at term, which was free from pituitary hormones as these hormones are destroyed at 60 degrees F., and the fourth group, urine from normal male adults. In the cases of the rabbits in the fifth group small pieces of placental tissue were introduced retroperitoneally and injections of a water extract of placenta were given. In the first four groups 4 c.cm. of the urine were injected twice a day for fifteen days, and in the fifth group 3 c.cm. of the placental extract were injected twice a day for the same length of time. No untoward symptoms were noted in any of the animals.

At the end of the fifteen days all of the rabbits were killed and examined. The findings of the examination are summarized as follows: 1. Rabbits treated with adult male urine showed no changes in their genital organs.

2. Rabbits treated with the urine of women at term and those treated with placental tissue plus placental extract showed a tumultuous development of some of the follicles, a tendency toward atresia and cystic degeneration in others, and regressive changes in the lining epithelium of the uterine cornua.

3. Rabbits treated with the urine of early pregnancy and those treated with "boiled" urine showed hypertrophic mucosa with an increase in the length and number of glands in the uterine horns as compared with the controls.

4. The thymus glands in the groups receiving pregnancy urine and the group treated with placental tissue and extract showed grossly a decrease in size with sparse vascularization and, microscopically, smaller and more irregular tubules, increased connective tissue, and more pale staining cells as compared with the controls.

The author comes to the conclusion that the urine of pregnant women as well as placental tissue and placental extract contains a substance which is capable of provoking regressive changes in the thymus gland of immature animals.

GEORGE C. FENOLA, M.D.

# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

Schwartz, G. Habitual Abortion (*Ueber das habituelle Abort*) *Zentralbl f Gynak* 934 p. 3

The cases in which abortion occurs spontaneously from a known cause and causal treatment can therefore be given are relatively few. They should not be considered as habitual abortions in the strict sense of the term. In a large number of cases of habitual abortion there is an abnormal sensitiveness of the uterus and abortion results because the woman does heavy manual labor in spite of slight labor pains or because of other indiscretions. In old primiparae early contractions may occur in the rigid uterus and give rise to labor pains leading to expulsion of the fetus.

The treatment given in these cases is bed rest and sedatives. However it is uncertain whether this is successful as occasionally women who have had one or two abortions carry fetus to term without any treatment. In no case has the author been able to demonstrate that avitaminosis was the cause of habitual abortion. The importance of the endocrine glands in the occurrence of habitual abortion is discussed briefly. The effects of even untested and unpurified organic preparations, especially those of the corpus luteum, are indisputable. However, the author leaves open the question whether only a specific effect or in addition, non-specific protein effect is involved (the serum of pregnancy). That lucas is a cause of premature birth is well known, but the theory that syphilis can cause only premature birth should be rejected as sometimes this condition is responsible for abortion. Even less all signs (the history and the clinical and serological findings) point against here, spermatocytes are often demonstrable in the fetus. Therefore course of antisyphilitic treatment is desirable in such cases. It is applicable also to cases of habitual abortion. The author has occasionally obtained good results from it. It emphasizes that rejection of newborns should be over a long period of time—preferably throughout the pregnancy.

(Katz & Schwartz) *Lancet* 1934, M.D.

## LABOR AND ITS COMPLICATIONS

Sjorvall, A. A Contribution to the Study of the Prognosis and Management of Breech Presentation (Contribution à l'étude du pronostic et du traitement de la présentation d'arrière) *Gynak* 1934, p. 216

The author includes in his discussion of breech presentation both cases in which delivery occurred spontaneously and those which intervention was necessary. His statistics are based on fifty cases

observed between the years 1912 and 1913 at the Rigshospitalet, Copenhagen. Of fifty-seven infants, only two died. Among the latter were five abnormal fetuses.

Like the infant mortality the maternal mortality was also higher than in normal deliveries. There was one case of uterine rupture.

The average weights of the infants are presented in a table and compared with those reported from other clinics.

The number of spontaneous deliveries and of deliveries requiring intervention in the cases of primiparae and multiparae are compared. The case histories are reported in detail.

Maxim W. Foster, M.D.

Heynemann, T. Spontaneous Transformation of a Face Presentation into an Occiput Presentation During the Period of Expulsion (Spontaneous Umwandlung einer Stirnpräsentation in Hinterköpfige während der Austrittsperiode) *Arch f Gynak* 934, 37, 349

The author reports a case in which, an hour after the second stage of labor the child was born in occiput presentation. The exact mechanism was not clear. The face presentation, as due to deviation of the occiput in the sacral hollow of the pelvis caused by hydramnios and pendulous abdomen.

As in all previously observed cases, so also in this case, the chin remained in the back before the change from deflection to flexion occurred. Persistence of the chin in the posterior position is certainly the first reason for change of the presentation. In the case reported narrow pelvis in which the chin became fast in the niche of the acutely flexed sacrum was not responsible. Neither could the change in presentation be attributed to excessive distention of the left wall of the uterus (the face of the child was directed toward the left) with consequent powerful contraction of this area. While active movements on the part of the fetus might have brought about the change, the author believes that this mechanism is possible only when the amniotic sac is still intact, i.e., at the beginning of the period of expulsion. If labor has been in progress for as long as eleven hours, the amniotic sac has been ruptured for two hours, the strength of the contractions of the uterus and of the abdominal muscles exceeds the activation of the flexor muscles of the neck to such an extent that the face presentation will remain tabloid.

If it is of the opinion that the position of the head and neck, plays a determining rôle in the

development of face presentation and that by changing the position of this axis by changing the position of the woman the face presentation can be changed to an occiput presentation. If the woman is laid on her right side when the face of the child is directed toward the left, the chin will sink more deeply and tend to turn forward. If the woman is allowed to sit up or stand, the uterus will fall over toward the left. Thus, in a case of mentoposterior face presentation the chin is raised and repeated change from the right lateral recumbent position to the erect position may change the neutral frontal presentation to an occiput presentation. In the case reported these mechanical requirements were met during labor.

(H. FUCHS) JOHN W. BRENNAN, M.D.

### PUERPERIUM AND ITS COMPLICATIONS

Kuestner, H. Increasing the Secretion of Milk with Anti-Thyroid Protective Substances (Steigerung der Milchsekretion durch antithyreoiden Schutzstoff) *München med Wchnschr*, 1934, 2, 1261.

In the production of milk the following factors play a rôle: (1) the previous size of the mammary glands, (2) the development of the mammary glands during pregnancy, and (3) the functional efficiency of the fully developed glands during lactation. Artificial influencing of the two first factors to increase the quantity of milk in women after delivery appears hardly possible. On the other hand, it seems feasible to attempt to improve the functional efficiency of the glands. Of the physical methods for this purpose, the best are massage of the breast, nursing, and thorough emptying of the breast after nursing. Complete emptying is accomplished better by milking than by the use of a breast pump.

Of the chemico-pharmacological agents, the sex hormones have been found to cause a marked development of the mammary glands in animals. However, their use should not be applied to human beings without further investigation. It has been noted, conversely, that the administration of thyroxin considerably decreases the secretion of milk. This observation suggested that by suppressing the function of the thyroid by the administration of anti-thyroid protective substances the formation of milk might be increased in women with an insufficient secretion. This assumption was proved correct by a series of observations. In women who were given such a protective substance (thyronormon or di-iodo-tyrosin) the quantity of milk increased and the time between the beginning of the secretion and the maximum secretion was considerably shortened.

For women who, after previous pregnancies, were able to nurse their infants for only a short time or not at all or whose supply of milk was insufficient, the author recommends the prophylactic administration of the protective substances. Occasional failures of this treatment he ascribes to inherited defects or too small mammary glands.

(K. J. ANSELMIANO) MATTHIAS J. SEIFERT, M.D.

Ducuing, J., and Guilhem, P. Obstetrical Phlebitis of the Subacute Venous Septicæmia Type (Les phlébites obstétricales à forme de septicémie veineuse subaigue) *Gynec et obst*, 1934, 30, 222.

Subacute venous septicæmia as a sequel to childbirth resembles somewhat the medical subacute venous septicæmia described by Vaquez and the postoperative subacute venous septicæmia described by Ducuing. The phlebitis is usually superficial and segmentary and develops in successive stages.

The authors report a very severe typical case in detail and discuss the clinical symptoms, diagnosis, and treatment of the condition.

A series of foci appear successively in the superficial veins, the appearance of each being ushered in by neurosympathetic symptoms such as a rise in the local temperature, pain, exaggeration of the shivering reflex, and peripheral symptoms such as slight œdema. If the pelvic veins are involved, visceral symptoms ensue.

In the lower extremities the œdema is often located about the malleoli. In the leg it is less marked, but is demonstrable when the calf is shaken. This œdema either disappears or extends to involve the entire limb. The extension does not proceed unbrokenly, the œdematous foci are separated by normal areas. In the abdomen, palpation and careful inspection are usually necessary to demonstrate infiltration. The veins of the upper limb may also be involved with resulting œdema of the elbow region and dorsal surface of the hand. Coincident with the œdema there is pain along the inner surface of the arm with a sensation of heaviness and functional impotence. Involvement of the veins of the pelvis is rare. It occurs at an early stage and is manifested by abdominal distention. Urinary symptoms may indicate prevesical pelvic involvement. Hæmorrhoidal congestions and tenesmus may indicate perirectal involvement.

Among the septicæmic symptoms are fever and chills of short duration. The infection is subacute and the general symptoms are very slight. A new phlebitic focus may appear without changes in the pulse or temperature.

The authors have noted four types of the condition: (1) a type with small successive foci, (2) a type with phlegmasia, (3) a type with quadriplegia, and (4) a severe type like that occurring in the case reported. In the type with small successive foci, which occurs chiefly in varicose subjects, the phlebitis involves principally the superficial veins of the lower extremities, the general symptoms are extremely mild, and the appearance of each new focus is manifested merely by slight pain localized to a venous tract, varicosity with slight redness and local heat, or, in a few cases, slight vasomotor disturbances and a slight rise in the temperature. In the type with phlegmasia there is involvement of the deeper vessels of the leg with resulting marked œdema of the whole limb, a veritable phlegmasia alba dolens. In the type with quadriplegia all four



limbs are involved and in the great majority of cases also the pelvic veins. In the severe type the symptoms are more marked and include chills lasting several hours and profuse sweats. Between the attacks the patient feels well so that an inexperienced observer might believe the condition cured. Soon, however, a new focus appears with renewed symptoms, recovery may not take place for many months, and death may ensue from embolism or septicemia.

In spite of the possibility of embolism, recovery results in most cases of subacute venous septic phlebitis. Embolism may be manifested first by a slight pain or bloody sputum. The authors cite cases in which it occurred on the seventeenth day proper diagnosis not having been made and treatment therefore having been inadequate. They believe that in this case early diagnosis with immediate immobilization might have saved the patient's life.

The diagnosis of *subacute venous septicemia* is fairly easy. It is sufficient to keep in mind the possibility of such condition in association with vasomotor disturbances, abdominal distention (soft and depressible), slight localized edemas, intestinal and urinary disorders, chills, fever and phlebitis. In the differential diagnosis such conditions as enterocolitis, coli bacillosis, cardiac edema, endocrine edemas, malarial chills and fever and puerperal septicemia must be ruled out. The determining factor in the differential diagnosis is the venous involvement.

The prognosis of phlebitis of the subacute venous septicemic type is favorable, but errors in diagnosis may lead to dangerous treatment. Strict immobilization with due consideration of the periods of latency is indicated as a new attack may occur on the first attempt to mobilize the patient. Mobilization should be instituted only under careful observation

of the temperature and pulse. Treatment for the septicemia, including a stimulating diet, abundant fluids, and serotherapy with Vincent's serum or immunotransfusion, is also indicated.

EARTH SCHWARTZ MOORE.

### MISCELLANEOUS

POWELL, R.: Evaluation of Clinical Statistics on the Relation Between Parity and Pathological Obstetrics (*Rivista statistico-clinica ed report on parità e patologia ostetrica*). *Riv. ital. di ginec.* 1934, 16: 308.

To determine the relationship of parity to the more frequent complications of pregnancy the author examined the records of 5,543 women delivered in the five-year period from 1928 to 1933.

He found that breech presentation occurred slightly more frequently shoulder presentation 3 times, and multiple pregnancy 5 times more frequently in multipara than in primipara. Eclampsia and eclampsia occurred 3 times more frequently in primipara than in multipara, while the incidence of albuminuria was about equal in the 2 groups. Placenta previa and premature separation of the normally implanted placenta were 3 times more frequent and postpartum hemorrhage was 3/2 times more frequent in multipara than in primipara. The incidence of puerperal infection was about equal in the 2 groups. Operative delivery was necessary 1 1/2 times more often in the cases of primipara than in those of multipara. Complete and incomplete abortions were 5 times more frequent in multipara than primipara. Venous thromboses occurred with about equal frequency in the 2 groups. The maternal mortality was slightly higher in the cases of multipara than in those of primipara.

GILBERT C. FROCK, M.D.

# GENITO-URINARY SURGERY

## ADRENAL, KIDNEY, AND URETER

Rabboni, F The Behavior of the Lactic Acid of the Blood in Suprarenal Insufficiency (Comportamento dell'acidolattemia nell'insufficienza surrenale) *Arch ital di chir*, 1934, 37 387

Following a review of the literature on the function of the suprarenal cortex with special reference to carbohydrate metabolism, Rabboni reports the findings of his studies of the lactic acid content of the blood in suprarenal insufficiency. In a series of experiments on dogs he first performed a hemisuprarenalectomy and then, after a period of about a month, he removed the other suprarenal from some of the animals. He studied the blood before, and at intervals of one to ten days after, the operation. The amount of lactic acid was determined by the iodometric method of Jervell. The statistics reported are based on the ten dogs that survived.

The results of the experiments, in general, indicated that the suprarenal cortex has an important influence on the lactic acid exchange. Beginning with the early days after the hemi adrenalectomy there was an increase in the lactic acid of the blood. The amount reached the maximum after from ten to fifteen days and then gradually returned to normal. The removal of the other suprarenal gland caused another increase.

The author states that the changes in the lactic acid content of the blood probably were due to a cortical insufficiency. They were not the result of a total medullary insufficiency as it is known that tissue similar to the suprarenal medulla is to be found also in other parts of the body. Adrenalin may be obtained from the carotid ganglion, the Zuckerkandl ganglion, and the sympathetic ganglia. The suprarenal cortex probably regulates the processes determining the destruction and removal of the lactic acid, which in large amounts is toxic to the organism. This action may be exerted by stimulation of the resynthesis of the lactic acid by the liver or by further combustion to carbon dioxide and water.

A. LOUIS ROST, M.D.

Beer, E., and Oppenheimer, B. S. Transplantation of the Adrenal Cortex for Addison's Disease. *Ann Surg*, 1934, 100 689.

Beer and Oppenheimer report two cases of Addison's disease in which three transplantations of human adrenal cortex were done. The adrenal tissue was obtained in kidney operations, stripped of the medulla, cut up into pieces the size of a match head, and transplanted into avascular pockets in the recti muscles. In one case the patient died fourteen days after the operation of a progressive bed sore with infection, but microscopic sections removed post mor-

tem showed the adrenal tissue to be viable. In the second case there was such remarkable improvement after the first transplantation that a second transplantation was done. The patient continued to improve and was able to leave the hospital and live a practically normal life. The improvement has now continued for six months, almost entirely without the use of "eschatin" on which the patient was totally dependent previous to the transplantations.

The authors cite the literature to show that heterotransplants are useless and that successful results from homotransplants have been reported also by others.

IRVING J. SHAPIRO, M.D.

Simpson, Levy, Dennison, and Korenchevsky. Some Effects of Adrenalectomy in Male Rats. *J Path & Bacteriol*, 1934, 39 569.

In studies of fifty-eight adrenalectomized male rats the authors found that decreased appetite and adrenal deficiency were responsible for impairment of growth, a decrease in the gain in body weight, and poor fat deposition.

Adrenal deficiency alone seemed to be responsible for an increase in the weight of the secondary sex organs and delay in the involution of the thymus. The increase in the weight of the prostate and seminal vesicles was considerable and constant, whereas the increase in the weight of the hypophysis was less marked.

The gain in body weight was much less in the adrenalectomized rats than in the controls.

When cortical extract was given the survival of the adrenalectomized rats was prolonged, but the changes in the organs persisted.

There was a slight drop in the hemoglobin and the erythrocyte count.

DONALD K. HIBBS, M.D.

Redl, R. Traumatic Lesions of the Kidney and Their Treatment (Les lésions traumatiques du rein et leur traitement). *J d'urologie méd et chir*, 1934, 38 231.

The author states that certain kidney injuries are best treated by immediate operation and others by more conservative methods. He emphasizes that early operation need not necessarily be a nephrectomy. The treatment and prognosis of each lesion depends upon an accurate early diagnosis of the anatomical and pathological disturbances.

Traumatic lesions vary from a slight parenchymatous tear requiring only conservative treatment to complete separation of the kidney from its ureter and pedicle. The differential diagnosis requires not only a knowledge of the general and local signs and urinary findings but also a careful and detailed examination. The author has found functional tests, such as the indigo-carmin-excretion

test, and psychography of great value. As he has had little experience with intravenous urography he prefers ascending urography in traumatic lesions of the kidney. He uses a 15 to 25 per cent solution of lithium iodide and has no fear of infection. He states that when the type of lesion has been determined and surgical interference has been decided upon, conservation of the kidney by various types of reconstructive operations is desirable when possible.

On the basis of his findings in animal experiments in which he injured the kidney and studied the process of healing, Redi divides the progress of the lesion into the following three stages: (1) hemorrhagic infiltration, (2) absorption of the clot, and (3) scar formation.

Five cases are reported in detail to illustrate the different types of lesions, the diagnostic procedures, and the therapeutic methods.

NATHAN A. ROWICK, M.D.

LLOYD, D. Clinico-Operative Considerations on Cases of Painful and Hematuric Nephritis (Considerations clinico-operatives en néphrite douloureuse et hématurique). *Arch. Mal. M.* 1934. 5.

The author reports his observations in the cases of eight patients with pain referred to the kidney or hematuria, or both, whose symptoms were relieved by decapsulation of the kidney. These patients ranged in age from fifteen to fifty years. Five of them were females. None of them gave a history of previous acute infection. Trauma was possible etiological factor in only one.

In five cases the pain was also associated with hematuria, but in three the hematuria was the chief manifestation.

The pain varied in intensity from that of typical renal colic due to a calculus to a mild, dull, continuous pain or a sense of eight in the lumbar region. It was always unilateral. In one case, however, decapsulation of one kidney for the relief of pain and hematuria was followed by the development of similar pain on the other side.

Hematuria, although the predominant symptom in three cases, was usually associated with various degrees of pain. Dysuria and frequency were occasionally noted. A demonstrable cause for these symptoms as found on cystoscopic examination. The author attributes them to reflex disturbances arising in the diseased kidney. Fever was never observed either during or after the attacks.

Urine examination showed blood and albumin in the majority of the cases.

None of the patients had noted gross or occult in the urine.

Physical examination of the involved kidney was usually negative except for tenderness over the lower pole.

X-ray examination failed to show renal calculi. Ascending pyelography was carried out only when the patient condition warranted otherwise descending pyelography was done with the use of

Uroselectan B. In one case the hematuria stopped immediately following the injection of the uroselectan.

During the operation anatomical changes were observed in the kidney and capsule. The capsule was thickened and adherent to the kidney in such a way that in a few cases great care was necessary in the decapsulation to avoid tearing the kidney parenchyma.

The fatty capsule showed scar-tissue infiltration and in places was intimately adherent to the true capsule by fibrous connective tissue.

Decapsulation was carried out in all cases and was followed by complete cessation of the symptoms. In one case nephrectomy was done on a kidney in which calculi could not be ruled out.

After reviewing the history of decapsulation of the kidney and the literature on the operation, the author concludes that the fibrous capsule begins to reform early; that after about twenty days it is again of normal thickness and that after 1 to 3 months it becomes about twice the normal size.

Decapsulation of the kidney destroys the vascular connections between the capsule and the kidney and there is no evidence that they reform.

After the operation there is an increase in the number of interlobular arterioles of the cortex, the interlobular veins, and the radial veins of the stroma of Verheyen with numerous anastomoses between them.

The circulation of the kidney is improved because there is an increase in the circulating blood per unit of time.

The renal function is in general improved and returns to normal within about two months.

The author concludes that decapsulation does not cause any harm to the kidney and improves the function and nutrition of the organ. He attributes its effect to a modification of the circulation under vasomotor influence of nervous nature which is probably secondary to the severance of the corticorenal nerve fibers.

PETER A. ROSS, M.D.

MCCURDY, G. A.: Renal Neoplasms in Childhood. *J. Pediatr. & Pediatr.* 1934, 29, 63.

McCurdy reports a study of thirty-one renal tumors in children—seven sarcomas, 1 cystic sarcoma, nephroblastoma, one carcinoma, and two teratomas. Most of the children were under three years of age and were boys. The left kidney was more often affected than the right. Clinically the neoplasms were characterized by a insidious onset followed by rapid enlargement of the abdomen and occasionally pain or hematuria. Metastases were frequent, and almost invariably the tumor recurred soon after operation and usually caused death in less than a year.

McCurdy states that in the teratoma elements derived from the three germ layers were found and organogenesis had progressed to a stage where intestine and skin with its appendages could be distinguished readily. The great majority of renal tumors in children are nephroblastomas. Two

important features peculiar to these tumors are (1) the constancy with which they are found encapsulated and apparently without invasion of the surrounding tissue, and (2) their great tendency to recur after surgical removal. They may metastasize to almost any organ. The metastases resemble the primary growth histologically. Pure carcinoma of the kidney in children is rare. The diagnosis of sarcoma of the kidney in children must be made with care because many so-called "sarcomata" contain primitive tubules and sometimes glomeruli and therefore are nephroblastomata. FRANK M COCHENS, M D

Geschickter, C F, and Widenhorn, H. Nephrogenic Tumors. *Am J Cancer*, 1934, 22 620

Geschickter and Widenhorn state that renal tumors may be related to the stages of development in the permanent kidney, that is, may be correlated with the normal phases of nephrogenesis. On the basis of the fact that the permanent kidney has a two-fold origin, they may be divided into two major groups, the medullary and the cortical. Nephrogenic tumors arising in the cortex constitute the majority of tumors arising in the kidneys, Wilms' tumors, and hypernephromata. Tumors of the excretory portion, which include papillomata of the renal pelvis and similar tumors of the ureter, constitute less than 5 per cent of renal neoplasms. The authors believe that all cortical tumors, whether they occur in childhood or in adult age, arise from the same nephrogenic zone.

They found that Wilms' tumors occur with equal frequency on the right and left sides and are as common in females as in males. The diagnostic tests employed by the authors are pyelography, the Aschheim Zondek test, and a course of deep X-ray therapy. For nephrectomy, they prefer the abdominal or transperitoneal route. A permanent cure is obtained in only from 5 to 7 per cent of cases, local recurrence being the rule.

The authors state that hypernephromata arise near the renal capsule in the cortical area of the kidney, and it is now conceded that most of them are carcinomata arising from the epithelium of the renal tubules rather than from adrenal nests.

In conclusion the authors state that their study seems to indicate that the variations in structure which make for separate types of tumor are the expression of various rates of growth and the extent of differentiation achieved by the individual form of tumor rather than an indication of an origin from separate and distinct tissues.

FRANK M COCHENS, M D

Bugbee, H G. Ureteral Occlusion Following Radium Implantation Into the Cervix. *J Urol*, 1934, 32 439

The author reports eight cases of ureteral occlusion following irradiation of the cervix for carcinoma. All but one of the patients were admitted to the hospital for vaginal bleeding and in the cases of all but one biopsy disclosed a squamous carcinoma of the

cervix. All were treated with radium. In all but one the radium was inserted into the cervical canal. In three, radium needles were introduced also into the cervix. Five received deep X-ray therapy in addition. In four cases the carcinoma extended into the vaginal wall. In no case were there evidences of metastases or urinary abnormalities at time of the first irradiation. The ureteral obstruction was bilateral in one case and unilateral in seven. In six, the functionless kidney was removed from five months to nine years after the irradiation. In two cases coming to autopsy the occlusion was found to be due to a carcinoma which had extended or metastasized to the ureter. The importance of a urological follow up of patients receiving radium treatment is emphasized. ANDREW McNALLY, M D

### BLADDER, URETHRA, AND PENIS

Riba, L W, and Christensen, F A. Urinary Bilharziasis. *J Urol*, 1934, 32 529

The authors describe urinary bilharziasis and report a case of the condition. They state that the disease is rare in the United States but endemic in parts of Africa, Asia Minor, and southeastern Europe. The causative organism is the schistosome haematobium.

The typical mucosal lesions of early hyperemia with edema followed by the appearance of pale yellow granules surrounded by hyperemia occur usually in the vesical neck and trigone. Later changes may produce grayish nodules which may coalesce to form a bilharzial node. The latter may be followed by ulceration or may become calcified and remain chronic. Tubercles may be mistaken for acid fast lesions. Papillomata may be formed. Submucous lesions may form with resulting fibrosis and calcification leading to the development of hypertrophy and trabeculation due to difficulty in micturition. Carcinoma in conjunction with bilharziasis has been reported. Urinary symptoms develop in from three to six weeks after the toxic stage of the disease. The most common urinary sign is hematuria. The diagnosis may be made by direct examination of the urine and cystoscopy.

Treatment with antimony and potassium tartrate has been replaced by the use of foudin.

DOUGLAS K HUBBS, M D

Kretschmer, H L. Diverticulum of the Bladder in Infancy and in Childhood. *Am J Dis Child*, 1934, 48 842

Kretschmer reviews nineteen cases of diverticulum of the bladder in infancy and childhood which he collected from the literature and reports six cases of his own. He considers only cases up to the age of twelve years. In the collected cases the ratio of males to females was 11:1.

In discussing the etiology of the condition the author reviews the various arguments advanced to prove that the diverticula are congenital or acquired. He calls attention to the presence of urethral or

vesical neck obstruction in the great majority of cases, especially those of adults, but cites three cases reported by Hyman in which careful examination failed to reveal obstruction. It states that while the symptoms are extremely variable the presence of a diverticulum of the bladder should be suggested by a suprapubic tumor which disappears on catheterization and is associated with dribbling and difficulty in urination.

Associated changes such as thickening of the bladder wall, obstruction at the neck of the bladder by contracture or urethral valves, and secondary dilatation of the ureters and kidneys are common. Many cases show also associated congenital anomalies, chiefly of the urinary tract. The diagnosis is established by cystoscopy and cystography. Intravenous urography has amplified it considerably.

The treatment consists in radical removal of the diverticulum and any obstruction that may be present, gradual decompression of the bladder and stabilization of renal function. If necessary a preliminary cystostomy should be carried out.

LEWIS J. SANCHEZ, M.D.

Franceschi, E. Radical Curettage of the Posterior Urethra (La curettage radical de l'urètre postérieur). *J. d'Urol.* 1934, 35, 93-97.

By radical curettage the author means destruction by electrocoagulation of all diseased parts of the posterior urethra which are visible on cystoscopic examination between the membranous sphincter and the vesical neck, including the verumontanum. If necessary the procedure may be carried out in several sittings. Electrocoagulation was first used by Franceschi in 1913 for treating cases of posterior urethritis which failed to respond to ordinary methods. Good results in such cases led him to practice systematic destruction of the verumontanum in the most severe cases. This was done to render the orifices of the ejaculatory ducts visible and make sure that an enlarged, inflamed, or calcified verumontanum was not obstructing them and preventing the discharge of secretions or drainage from diseased seminal vesicles or prostate. In this article Franceschi reviews 100 cases in which the procedure was carried out reporting 88 of them in considerable detail. In all, there was extensive pathological change in the verumontanum and the orifices of the ejaculatory ducts are variable. On the basis of the cystoscopic appearance 5 varieties of verumontanum are recognized: (1) cystic, (2) infiltrated, (3) sclerotic, (4) mixed (cystic and infiltrated) and (5) absent.

The radical curettage described is carried out on ambulatory patients under local anesthesia. The pre-operative preparation consists of a preliminary temporary stentization of the anterior urethra. In this procedure urethrotome irrigation is done with large quantities of weak potassium permanganate or an eucaine of mercury. A metallic prostatic electrode is then inserted and 5 c.c.m. of 1 per cent novocain or other similar膏 are slowly in-

stilled around it. While this solution is retained by an elastic clamp, a diathermy current of from 300 to 400 ma. is passed through the electrode for ten minutes. Such treatment given twice daily for from five to ten days results in almost perfect sterilization of the operative field. Prior to the cystoscopic examination the urethra is explored with a bougie à balle and the prostate and seminal vesicles are examined by palpation, always with a known quantity of fluid in the bladder. For anesthesia the author makes up a stock solution of 5 per cent novocain with 80 per cent chloroform to which 50 drops of a 1:10,000 solution of adrenalin are added for each 100 c.c.m. Ten cubic centimeters of this solution diluted so it contains 1 per cent of novocain are instilled and retained. Every five minutes 10 c.c.m. more of an increasingly stronger solution are instilled until, at the end of half an hour, 5 c.c.m. have been injected, the last 10 c.c.m. with at least a 4 per cent content of novocain. The McCarthy cystoscope is then introduced. After careful inspection the coagulation is started. It is begun at the vesical neck. All tissues which appear abnormal are treated with the weakest current possible. If bleeding is not excessive and the patient stands the procedure well, the verumontanum is coagulated last. Otherwise it is treated at a second sitting. Following irrigation of the operative field, the scope is removed, the patient is instructed to void, and 5 per cent novocain is instilled and left in for ten minutes. The patient is then permitted to go home, but is told to return after twenty-four hours for irrigation and the instillation of novocain if that should be necessary.

After six or seven days the discharge has usually subsided. A cystoscopic examination is then made for observation and, if necessary, additional coagulation. The regeneration of the mucosa in this period is remarkable. If the verumontanum has been destroyed, the orifices of the ejaculatory ducts and often of the urethra are visible. When they are patent, massage and diathermy are resumed with the assurance that adequate drainage of the prostate and vesicles is possible. During the later stage of the treatment coitus is not forbidden as it is a physiological complement to massage.

In the second part of this report there are eight colored plates showing the condition in some of the cases reported in the first part. This part of the article consists of a critical analysis of the rationale of the procedure and discussion of the types of cases in which the method should be used and the reactions to be expected. The author re-emphasizes the fact that irrigation, diathermy and prostatic massage will accomplish little if free drainage from the prostate and seminal vesicles is prevented by obstruction of the ejaculatory ducts by the diseased verumontanum. He discusses in detail the 5 varieties of verumontanum and the reaction of each to coagulation. The true cystic types are treated most easily as they collapse with a crushing sound with one application and do not tend to bleed. The infiltrated types include hard and soft types. The

## GENITO-URINARY SURGERY

former feel like a solid tumor when touched with the probe and are rather difficult to destroy, several seances usually being necessary. The soft infiltrated types are easy to destroy with minimal currents, but bleed abundantly. The sclerotic types are irregular and show numerous whitish scars. Coagulation of these types causes severe pain, requires nearly twice the strength of current as coagulation of the infiltrated variety, and tends to be complicated by postoperative hemorrhage. The mixed type of verumontanum consists partly of cysts and partly of scarred areas. The verumontanum was absent in two of the 100 cases reviewed.

In conclusion the author discusses the appearance of the posterior urethra following radical curettage

MAX M. ZINZINGER, M.D.

Graves, R. C. The Treatment of Malignant Disease of the Penis. *J. Urol.*, 1934, 32: 501

Carcinoma of the penis is relatively rare. As it is usually radioresistant reliance must not be placed on radium or X ray irradiation for cure. Partial amputation is satisfactory when it is possible. In many cases the radical operation may be modified to advantage. The author describes a modification of the classical radical operation which he has found very satisfactory.

A low suprapubic vertical skin incision is made and the lower end extended around the base of the penis. The scrotum is not bisected. The amputation of the corpus spongiosum is done well away from the tumor with a high frequency knife. The urethral stump is left long enough for transplantation into the perineum without tension. The urethra is dissected from the corpora until it can be brought out through a perineal stab wound. The corpora are amputated near their attachments with a mildly coagulating current. Closure is effected by suturing the middle of the cut edge of the scrotum to the apex of the suprapubic incision. The gland dissections are carried out through separate incisions made parallel with Poupart's ligaments to within one fingerbreadth of the spine of the pubis where they are curved downward and outward across the area of the femoral triangle. The operation is followed by high-voltage X ray therapy.

ANDREW McNALLY, M.D.

## GENITAL ORGANS

Kirwin, T. J. The Treatment of Prostatic Hypertrophy by a New "Shrinkage" Method. *J. Urol.*, 1934, 32: 481

High frequency currents are used in medical practice for (1) diathermy, (2) coagulation or destruction of tissue *in situ* and (3) excision and removal by a cutting current. The difference in these effects depends upon the amount of heat generated in the tissues, and this in turn is governed by the current density applied.

Non destructive shrinkage is a heat treatment with the high frequency current in which a given current density is applied to a measured area of

tissue for a definite length of time. The unit of measurement of the current density is the "millimil." The depth to which the heat will penetrate during a given time period can be predetermined.

Such thermal shrinkage should not be confused with electrocoagulation or with fulguration as both of the latter are destructive. The shrinkage method withdraws fluid and coagulates albumin so that the treated tissues are reduced in volume and changed in consistency. The temperature within the tissues is raised to a degree which kills living adenomatous cells, but does not injure blood and lymph vessels. The object is to carry the heat treatment beyond the point of tolerance in the unanesthetized patient (in diathermy), but not to the point of tissue destruction, as in coagulation.

This method is new only in the better control of the amount of heat applied. By the coagulation of albumin and evaporation of tissue fluids, the gland can be greatly reduced without subjecting even the most debilitated patient to the chance of surgical shock.

An instrument designed for the efficient application of this procedure is described and illustrated, and a number of cases in which it was used are cited.

LEAF M. COCHRAN, M.D.

Caulk, J. R., and Harris, W. A Study of the Comparative Effects of Various High-Frequency Currents and of Thermal Cauterization in Prostatic Resection. *J. Urol.*, 1934, 32: 449

Because of the present popularity of transurethral operations on the prostate, the authors deemed it important to investigate the effect produced by high frequency currents and thermal cauterization. The heat produced in gelatin, meat, and living tissue by a cutting high-frequency current and a coagulating current was compared with the heat produced by the thermal cautery by means of a thermocouple at varying distances from the electrode or cautery. The effects of such currents on living tissue were investigated also microscopically to determine the depth of necrosis and tissue death.

It was found that the heat produced and the depth of necrosis were greatest when the cutting high frequency current was used, less when the coagulating current was used, and least when the thermal cautery was employed.

The authors conclude that the removal of prostatic tissue by excision followed or preceded by coagulation or removal with the cautery is much safer than the use of any apparatus in which a high-frequency cutting current is employed.

THEOPHIL P. GRAUER, M.D.

Zephirido do Amaral. The Treatment of Varicocele by a New Surgical Method (Traitement du varicocele par une nouvelle methode chirurgicale). *J. d'urologie méd. et chir.*, 1934, 38: 249

Attention is called to the unsatisfactory results obtained by previous standard operations for varicocele in which venous ligation is done. Atrophy of

the testicle and subjective symptoms of various types are frequent. The author is of the opinion that the two major requisites for successful results are: (1) an effective, simple orchidopexy and (2) diminution or suppression of the venous stasis without mutilation of the vascular system or disturbance of the nutrition of the testicle.

He describes in detail a technique he has previously described and adds minor modification. This technique, which is simple, is shown by illustrations. It consists essentially of the Bassini operation for hernia except that the varicose veins are dissected from the cord and brought out in a loop through the aponeurosis of the external oblique just medial to the original incision. The cord is transplanted beneath the aponeurosis of the external oblique as in the classical Bassini operation. Orchidopexy is done by inverting the vaginalis as in the hydrocele operation.

The operation has been found satisfactory as a routine procedure by the author and his colleagues. It is recommended especially for cases in which there is coexistent hernia or hydrocele.

NATHAN WOLACK, M.D.

Hergert, C. C., and Thibodeau, A. A.: Teratomas of the Testis. (*Am. J. Cancer* 514, 55)

The authors review fifty-six cases of malignant disease of the testis in which histological studies were made during the last twenty years at the State Institute for the Study of Malignant Disease, Buffalo, N. Y. These included seven cases of malignant teratomas with adult features, twenty cases of embryonal carcinoma (seminoma), seventeen cases of embryonal carcinoma with lymphoid stroma, and eleven cases of embryonal adenocarcinoma.

Of the seven patients with malignant teratomas with adult features, all had metastases at the time of their admission to the hospital. Five have died, one developed metastases after X-ray therapy, and one, who was eleven months old when admitted to the hospital, remains well nine years after treatment.

Of the twenty patients with embryonal carcinoma (seminoma) all but one had metastases when admitted to the hospital. Sixteen have died, two are still under treatment, one cannot be traced, and one has been well for ten years.

Of the seventeen patients with embryonal carcinoma with lymphoid stroma, the above were free from metastases when admitted to the hospital, are alive and well from one to eight years after treatment, and of the eight who had metastases when they entered the hospital, five are living after periods ranging from one year to ten years since the treatment.

Of the eleven patients with embryonal adenocarcinoma, all had metastases or a local recurrence when they entered the hospital and ten are dead.

No cases of chorionepithelioma were seen.

The treatment was simple, consisting of orchidectomy followed by deep X-ray therapy. In most cases the operation was performed elsewhere, the irradiation therapy was not given until several months after the surgical treatment.

Of the thirty-six patients who could be traced three years after the treatment, thirteen (36 per cent) were found alive.

In the prognosis the determination of the excretion of Prothion A in the urine is of importance. If the treatment produces and maintains a low level of excretion of Prothion A, the prognosis is more apt to be favorable.

ANDREW McMILLIN, M.D.

# SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

## CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC

Fraser, I. *Fragilitas Ossium Tarda* *Brit J Surg.* 1934, 22, 231

*Fragilitas ossium tarda* is one of the best known and most constant forms of a condition of congenital brittleness of bones known as osteogenesis imperfecta. In this form there is a period of from two to seventeen years when fractures occur readily but are followed by a normal union. A second period, beginning at puberty, is characterized by extreme sclerosis of the bone. The ears are also affected, deafness of the osteosclerotic type resulting, and an arcus senilis is common. If the patient survives the first period, he may expect to reach an average age.

Characteristic features of the disease are a deep blue color of the sclera and broadening of the skull. The author reports in detail the pedigree of a family of twenty members representing four generations. Of these, seventeen had deep blue sclera, ten had multiple fractures and five were deaf (chemical studies of the blood revealed no abnormalities). A hormonal disturbance is suggested as the etiological factor, but its nature is unknown.

CULSTUP C. G. M.D.

Santi, E. *Osteomyelitis in the First Years of Life* (*Osteomielite nei primi anni della vita*) *Arch ital di chir.* 1934, 38, 1

This report is based on 366 cases of osteomyelitis in children under eleven years of age who were admitted to the Surgical Pediatric Clinic of the Royal University of Florence in the period from 1900 to 1933. The diagnosis was made in the first year of life in 48 cases, in the second in 72, in the third in 17, in the fourth in 43, in the fifth in 36, in the sixth in 25, in the seventh in 50, in the eighth in 51, in the ninth in 39, and in the tenth in 35. In 12 cases it was made in the first month of life.

The bacteria found most frequently in this condition are streptococci, diplococci and diplostreptococci. Less common are staphylococci, colon bacilli, and the bacillus *faecalis alcaligenes*. Among the causes of osteomyelitis in infants are infection of the child during delivery, infection of the cord, mastitis in the mother, infection of the infant's skin, respiratory infections, and syphilis. In 2 of the cases reviewed the condition developed after vaccination against smallpox. Santi believes that in these instances it was due to lack of asepsis.

The infection is usually blood borne and involves epiphyses, the metaphyses, or diaphyses depending largely on the age of the infant. In the 87 reviewed cases of children under four years of age, 100 foci

of osteomyelitis were found. Of these, 32 were located in epiphyses, probably because of the peculiarities of the circulation in these growing portions of the bones. The upper epiphysis of the femur was the site of osteomyelitis in 12 instances, the lower epiphysis of the femur in 4, the upper epiphysis of the humerus in 3, the lower epiphysis of the tibia in 2, the upper epiphysis of the tibia in 3, the upper epiphysis of the ulna in 1, the lower epiphysis of the radius in 1, and the upper epiphysis of the ulna in 1.

Because of its frequency and the many studies of the problem Santi discusses in considerable detail whether the lesion starts as an infection of the synovial membrane and spreads into the bone secondarily. He cites previous work of his showing that in nursing, purulent arthritis may occur without involvement of bone. He states that osteomyelitis of the hip is most common at the age of six months, but may become manifest very soon after birth. The lesion commonly produces a deformity of the head and neck of the femur. The dislocation may be confused with congenital dislocation of the hip. While the epiphysis is the most frequent site of osteomyelitis in the first years of life, the body of the diaphysis is a common site of bacterial emboli because of its abundant blood supply. Involvement of the metaphysis is frequent both in infancy and after the second year of life.

Santi next discusses osteomyelitis in the diaphyses of the long bones and presents clinical notes and roentgenograms made in a case of that condition. He states that osteomyelitis in infants may start also in the metaphyses. There it runs a rapid destructive course, which the author shows by roentgenograms.

Santi emphasizes the great value of roentgenography in the diagnosis of osteomyelitis and reviews some of the roentgen findings. He presents statistics to show the frequency with which the disease is localized in the various bones. In the 87 reviewed cases of infants under four years of age the 100 foci were distributed as follows: diaphysis of femur, 24, epiphysis of femur, 16, diaphysis of tibia, 7, epiphysis of humerus, 8, diaphysis of tibia, 7, epiphysis of radius, 5, diaphysis of radius, 5, epiphysis of ulna, 3, epiphysis of fibula, 1, diaphysis of fibula, 2, epiphysis of fibula, 1, metacarpus, 1, astragalus, 1, and metatarsus, 1. Santi states that the difference in the distribution in the adult and the child are due to differences in the degree of development of the bones.



Attention is called to the high incidence and mortality of osteomyelitis of the maxilla due to infection from the mouth or nose. For this condition Santl advises early conservative treatment with incision of the lesion preferably through the mouth.

In infants osteomyelitis runs a varied course with a multitude of symptoms. Santl compares the symptoms with those occurring in adults. He states that in nurslings very acute forms with fatal septicemia are not uncommon and the infection may be attributed by the physician to other than the true cause. In newborn and young infants bacteria may enter through an insignificant wound and produce osteomyelitis with general infection or a localized osteomyelitis. While roentgen examination is of great aid in the diagnosis, osteomyelitis is not necessarily ruled out by a negative roentgenogram.

In nurslings the course of the disease is generally faster and more destructive than in older children. The prognosis is grave both for life and function.

Of the 87 children under four years of age whose cases are reviewed by the author 36 were cured, 41 died, and 10 could not be traced. In the 48 cases of children under one year of age the mortality was 50 per cent (24 deaths). In the 23 cases of children two years old, it was 45 per cent (11 deaths) and in the 7 cases of children 3 years old it was 3 per cent (4 deaths).

The treatment should be directed first of all to keeping the child in the best possible general condition. For this purpose injections of from 5 to 10 c.c.m. of maternal blood 2 or 3 times on alternate days are invaluable. Surgical treatment should be more conservative than in the cases of adults. Suppuration should be treated by incision and drainage. In less severe cases the patient should be watched and necrotic bone removed. In more acute cases the bone may be trephined. Arthritis is treated by arthrocentesis with or without drainage, depending on the acuteness of the process and the severity of the bone lesions. After the operation the knee and hip should be immobilized to prevent deformity.

FRANK T. LAMOR, M.D.

Gwynne, F. J., and Robb, D. Calcareous Deposits in the Supraspinatus Tendon and the Subacromial Bursa. *Australian & New Zealand J Surg* 1934, 4, 53.

The cause of deposits in the supraspinatus tendon and subacromial bursa is unknown. Trauma producing an effusion of blood with the subsequent deposition of lime salts is generally considered to be the most important factor. The deposit is thought by some to be capable of rapid formation and disappearance, but this theory is probably explained by the technical difficulties in the roentgenological demonstration of the deposits in certain cases. The deposit may act as a foreign body producing secondary inflammatory reaction.

The lesion is most common in females and is sometimes bilateral. The patient may complain of acute or chronic shoulder pain. The pain is often

most marked on abduction and external rotation of the arm. In chronic cases it may be associated with limitation of motion and muscular atrophy. Tenderness may be marked over the greater tuberosity of the humerus. The diagnosis is made from roentgenograms which reveal opaque or calcareous deposits in the angle between the head of the humerus and the acromion. These deposits vary from a few millimeters to a few centimeters in size. They may overlie the humeral head so that they may easily be overlooked. When such deposits are suspected, the central ray should be directed 0 degrees toward the feet and 10 degrees outward to bring into profile the greater tuberosity and the site of the attachment of the supraspinatus tendon. Roentgenograms cannot always be depended upon to differentiate epuritis in the supraspinatus tendon or subacromial bursa from opacities in the joint capsule.

The treatment is either conservative or surgical. Conservative treatment includes rest, diathermy and massage. Of the ten cases reported in this article, nine were treated conservatively with satisfactory end-results. In two, however, convalescence was prolonged and in one a recurrence developed.

CAROLINE C. GAY, M.D.

Lanzardi, R. A Contribution to the Diagnosis of Exostosis Bursata of the Scapula. (Cistiroidi alla cistioidi della scapola bursata della scapola) *Chir d'organi di movimento*, 1934, 9, 10.

The pathology of exostosis bursata is not so well known as that of cartilaginous exostoses. Lanzardi discusses the etiology, pathology, and treatment of the disease and reports a case of involvement of the scapula. Such involvement and especially the presence of a pseudo-articulation in the scapula is rare. In fact, Lanzardi has been unable to find a report of a similar case.

The patient was an otherwise normal woman twenty-two years of age who six months previously sustained an injury to the back which did not involve the scapular region. The shoulder then "grew" rapidly. Later its growth was arrested, but sensory disturbances in the arm and limitation of movement in the scapulohumeral joint developed. Clinical and roentgen examination revealed round pedunculated excrescence with a trabecular structure, the size of a tangerine, on the anterior vertebral margin of the scapula. The growth had hollowed out the sixth and seventh ribs over which it glided.

At operation the cartilaginous border of the growth was found covered by a thick layer of fibrous tissue which was inserted into the ribs. This contained bursae lined with endothelium and filled with synovial fluid. The bursa was adherent on one side to the costals and on the other side to the ribs.

According to Lanzardi's theory the exostosis developed from the epiphysis on the vertebral margin of the scapula. The formation of the bursa was due to the continuous trauma, the ischemia, and the displacement, trophy and liquefaction of the hyper-

plastic connective tissue. Its primary origin was a dilated lymph space. The theory that such exostoses originate from the epiphyseal cartilages rather than as lateral proliferations from the joint cartilages is based on (1) their typical site—in flat bones in proximity to the marginal epiphyses, often at a distance from the joint, (2) their limitation to parts of the skeleton having a cartilaginous phase of development, (3) their appearance during the growth period, and (4) the variability and irregular arrangement of the cartilage cells in the exostosis as compared with the articular cartilage.

The diagnosis is generally not difficult. It is based chiefly on the presence of a peduncle (which usually rules out sarcoma), the youth of the patient, the arrest of the tumor growth on completion of the patient's growth, and the origin of the tumor at the site of an epiphyseal cartilage. The diagnosis of a bursa is exceedingly difficult even with roentgen examination.

Removal of a scapular exostosis is always advisable because of the pressure necrosis of the ribs. The article contains a roentgenogram and photographs of the tumor, and is followed by a bibliography.

M E MORSE, M D

**Kistler, G H Sequences of Experimental Infarction of the Femur in Rabbits** *Arch Surg*, 1934, 29 589

A number of lesions etiologically obscure but with certain characteristics in common have been found in various bones. Among these are, Koenig's osteochondritis dissecans of the median condyle of the femur, the osteochondritis deformans juvenilis of Legg, Calvé, and Perthes, Sudeck's acute atrophy of the tibial tubercle, Sudeck's acute atrophy of the bone, necrosis of the tarsal navicular bone (Koehler's disease), the bodies of the vertebrae (Freid's disease), the heads of the metatarsal bones (Freid's disease), the heads of the metatarsal bones (Freid's disease), also described by Koehler, and of the carpal lunate bone (Kienbock's disease), and occasional foci in many other bones, particularly those of the lower extremity. After reviewing the literature the author sought to accumulate further data on the pattern of the circulation in bone and the nature of infarcts in this tissue as a possible explanation of osseous necroses. His studies were made on rabbits.

Since simple ligation of vessels alone is unsatisfactory, bland emboli consisting of a 2 per cent suspension of charcoal in a physiological solution of sodium chloride with a 5 per cent content of acacia were injected into the nutrient artery. Infarcts were produced in the femora of young and adult rabbits by this intra-arterial injection and by the interruption of one or more nutrient vessels outside the cortex of the bone. The production of necrosis of bone by the intra-arterial injection of particulate charcoal supports the theory that anæmic infarction may occur in these tissues despite their great vascularity. It demonstrated also that the vascular system of the femur of the rabbit is closed, otherwise such emboli would be only foreign bodies disseminated in the

tissues without the production of nutritional disturbances. The infarcts formed were intimately associated with the metaphyses of growing bones. This finding is in agreement with the general theory that the cartilage epiphyseal line is often the site of osseous lesions considered as necroses. The difficulty encountered in producing infarcts in the adult femur and the tendency of infarcts produced in the adult femur to be near the center of the shaft when the injection was made into the nutrient artery to the shaft emphasize the alteration in the circulation that occurs when the epiphyses and the diaphysis unite. When the continuity of bone is interrupted, the severed portions can no longer depend on each other and therefore require other sources of blood supply. If the collateral circulation is inadequate, nutritional changes follow. This is the condition in so-called aseptic necrosis of the head of the femur which occurs in adult as well as growing femora. The infarcts produced in rabbits demonstrated absorptive reactive changes but no sequestration of dead bone. The necrosis and reactive changes that occurred in from twenty hours to one hundred and fifty days after the infarction are described and correlated with the more common clinical entities associated with necrosis of bone.

ROBERT C. LONERGAN, M D

**Cella, C An Anatomicofunctional Study of the Round Ligaments of the Femur (Note anatomicofunzionale sul legamento rotondo del femore)** *Chir d organi di movimento*, 1934, 19 207

Cella reviews briefly the normal anatomy of the round ligament of the femur (ligamentum teres) and then discusses the peculiarities of its blood supply. As is well known, this ligament has, in addition to the usual network derived from the blood supply of the neighboring bones, a special arterial supply—the artery of the round ligament—derived from the middle circumflex artery of the femur, and, at times also, a branch from the obturator artery. According to Hyrtl, Luschka, and Henle, the arterial distribution is irregular and inconstant. The variation in the relationships of the blood supply occurring with age have been the subject of controversy. Cooper, Luschka, and others hold the view that the arteries are obliterated with age, whereas Schmorl has demonstrated patent vessels in the round ligament in the aged, and Nussbaum holds that the vessels may be obliterated in the young and persistent in the old.

In histological studies of the round ligament in man and dogs of various ages, Cella found hypertrophy of the tunica interna and media of the artery and obliteration of the smaller vessels with reduction of the capillary supply but not of the larger vessels. He never observed complete obliteration of the vessels. It is evident, therefore, that the head of the femur may receive blood by these routes throughout life although the supply decreases from childhood to old age. The ligament is similar in structure to other articular ligaments, being made up of loose connective tissue with numerous elastic

fibers. Cella presents photomicrographs showing the blood supply. With age, the ligament becomes infiltrated by fat and at times by deposits of bone. At birth, it is well developed. It grows proportionately with the head of the femur although it often shows great individual variations. While some investigators have noted its congenital absence, Cella found it present in all of 300 cadavers. In inactive subjects it may be small and after prolonged disease of the leg it may atrophy. It may be the site of an infectious process such as tuberculosis, and may become involved by the metastases from cancer of the breast or stomach.

With regard to the function of the round ligament there are 3 theories. According to 1 the ligament has a purely mechanical function. According to another it is a rudimentary structure without function. According to a third, it is a carrier of cords to the head of the femur. Cella believes that, in addition to being a carrier of vessels, it acts also as a reflex on the movements of the femur by keeping the head of the femur in the acetabulum.

ECORNA T. LEXER, MD

Waherum, W. The Elastic Supportive System of the Human Foot (Das elastische Stützsystem des menschlichen Fußes). *Arch f. klin. Chir.* 1934, 34, 461.

While the arch of the foot has been attributed to the arrangement of the bony arch of the foot, the author's studies show clearly that it is due solely to the plantar pads of fatty tissue. The fatty tissue medial is formed by a pad of fat under the heel and another under the heads of the metatarsals which are connected by a thin layer of fatty tissue. This medial forms the walls of three arches which give the sole of the foot its characteristic shape.

The elastic supportive system of the foot is made up of the plantar epidermis, the subcutaneous fat of the sole of the foot, the aponeurosis plantaris, the plantar musculature, and the plantar fascia and ligaments including the plantar sections of the capsules of the metatarsophalangeal joints. This supportive system is made up of an intricate system of connective tissue strands which take their origin from the plantar aponeurosis. Under the heel and the anterior ball of the foot the plantar epidermis is much thicker than over the arch. Beneath the plantar epidermis is the subcutaneous fat which, because of its cellular and structural characteristics, is a very essential functional component of the foot. The plantar fat pads are made up of a system of connective tissue compartments in which the fat cells lie. The fat medial is limited above by the peroneous plantaris, in which it is intimately connected by the connective tissue compartment system.

In the light of these facts the problem of the weight bearing of the fore-foot assumes a new aspect. It is true that the heads of the metatarsal bones are arranged in the form of an arch, but they are thus maintained, not by ligamentous supports, but by

the fatty pad under the fore-foot. This pad is most pronounced under the second and third metatarsal heads, less pronounced under the fourth metatarsal head, and absent under the first and fifth metatarsal heads.

In conclusion the author describes a new type of delay arch support.

(B. VALETTE) JOHN B. BERNARD, MD

## SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Langs, M. Arthrodesis of the Potters-Labrier Ankle Joint—Talo-calcaneal Joint—in the Treatment of Severe Malformation of the Foot, Especially Flat-Foot and Club-Foot (Die Arthrodesis des hinteren internen Sprunggelenks—Talo-calcaneal-Arthrodesis—zur Behandlung schwerer Fehlbildungen, insbesondere des Platt- und Klumpfüßes). *Chirurg.* 1934, 6, 519.

In the cases of young persons with flat feet it is frequently impossible to reduce the typical pain below and around the external bone by conservative treatment. The cause of the failure is a morphologically demonstrable arthrosis deformation in the talocalcaneal joint to which even seventeen-year old persons show a tendency. Operation should not be delayed until, as a result of increased and excessive weight bearing, all of the joints of the foot show arthrosis.

The author reports twenty-seven cases, all bilateral, in most of which operation was performed in the second decade of life. Although the patients were barely able to walk before the operation, all except two are now capable of full work, even in farming and forestry. The technique used by the author is as follows:

An arch shaped external incision is made around the outer malleolus and Z-shaped division of the peroneus longus muscle is done. The tendon of the peroneus brevis is divided with a piece of peroneum. It is inserted and then sutured to a more posterior site. The joint is opened and the cartilage removed. The author uses great unnecessary removal of cartilage.

The internal incision is made from the tip of the internal malleolus anteriorly to the head of the talus. More bone is removed on the inner side (talus and calcaneus) than on the outer side, but on the whole the removal is done sparingly. The valgus position of the os calcis is then corrected. Following the correction a padded plaster-of-Paris cast is applied for two weeks. At the os calcis in the median position and the front of the foot in slight supination. At the end of the first two weeks a second plaster cast is applied for two weeks. The arch is then rammed out and the anterior part of the foot placed in a position of slight pronation. A third plaster cast is then applied for four weeks, together with an ambulatory splint. At the end of that time splint with an orthopedic shoe is worn for from six months to a year. Ossification sometimes takes a long time.

In very severe cases it is necessary also to make the arch-shaped osteotomy in the neck of the talus, remove a disk-shaped piece, and apply the latter to the outer side between the os calcis and the astragalus.

Lange uses the same typical arthrodesis also in all cases of club-foot after the tenth year of life, whether preliminary treatment has been given or not. Many adults upon whom he has operated in this way were advised previously to submit to amputation. In such cases the technique is simpler because the peroneal tendons need not be divided and an external incision is sufficient. A small wedge-shaped disk of bone together with the articular cartilage must be removed from the os calcis and astragalus up to the inner side. The varus position can then be corrected easily. In contrast to flat-foot, however, more than this arthrodesis is required. It is necessary also to chisel out a wedge from Chopart's joint from without. This operation has been done repeatedly for club foot with good results. It is indicated for both the congenital and the paralytic types. The correction of the os calcis is of decisive importance for posture and is achieved by the arthrodesis far better than by osteotomy on the os calcis (Elsner, Hohmann, and Man).

(FRANZ) LOUIS NEUWELT, M D

## FRACTURES AND DISLOCATIONS

**Milkman, L A** Multiple Spontaneous Idiopathic Symmetrical Fractures *Am J Roentgenol*, 1934, 32 622

The condition which the author calls "multiple spontaneous idiopathic symmetrical fractures" considers a disease entity is systemic. It involves the flat as well as the long bones. It originates in the cortex, but slowly encircles the entire bone. Its special peculiarity is symmetrical involvement of the bones. The onset is insidious, the cause unknown, and the course progressive with intermissions. The symptoms include a waddling gait, pain in the lower back, and localized pain in the individual bones. Physical examination is essentially negative except for tenderness. Roentgenograms show characteristic bands of radiopacity suggesting complete disappearance of the bone structure. The bone above and below the transparent zones looks normal except for thinning of the cortex. There is no deformity until late in the disease, when displacement of the fragments may occur. There is no attempt at repair. The blood findings are essentially normal.

A case of the condition reported in detail was that of an unmarried school teacher forty-three years of age who gave a history of pain in the back and difficulty in walking for about seven years. In the later stages of the disease a complete fracture of the right femur occurred and was followed a month later by a fracture of the left femur. There was no family history of peculiar bone lesions. The patient had been under medical supervision almost constantly since the onset of her illness. After death forty

three defects were found in the skeleton. The author reports the laboratory data, the findings in serial roentgenograms, and the results of the post-mortem examination. The report of one pathologist (Geschickter) was osteopsathyrosis, while that of another (Custer) was osteomalacia in a comparatively rare senile form. A somewhat similar case has been reported by Michaelis.

The author discusses the differential diagnosis at length. He states that the condition must be differentiated from late rickets, osteomalacia, and fragilitas ossium. So far as could be determined from pathological study, the parathyroid glands are not involved. The course of the disease is not influenced by heliotherapy or Vitamin D. The post-mortem demonstration of increased vascularity at the zones of transparency suggests a trophic disturbance.

BARBARA B STIMSON, M D

**Moore, J J, and De Lorimer, A** The Calcium Stream as Concerned with the Healing of Fractures *Am J Roentgenol*, 1934, 32 457

The authors present the results of their investigations of the healing of fractures of rabbits when (1) the general tissue balance was left within normal limits, (2) there was a shift to the acid side, and (3) an alkaline balance was produced. The three groups of animals were provided with ample calcium, phosphorus, and vitamins and at frequent intervals were given calcium gluconate, lactose, and cod liver oil by intubation. In the earlier experiments the tibia was broken, but in the later experiments the fractures were produced in the metatarsals in order to diminish factors which might influence healing such as hemorrhage and the interposition of tissue. Throughout the experiments roentgenographic studies and biochemical analyses were made.

In the first group of experiments homogeneous ossification occurred at the fracture site. In those of Group 2, in which sodium bicarbonate was added to the diet, an elevation of the hydrogen-ion concentration and carbon dioxide and a reduction in the calcium of the blood were found. The urinary excretion of calcium and inorganic phosphorus continued at a minimum. Roentgenograms showed a less uniform ossification of the callus than in the controls. In the experiments of Group 3, in which ammonium chloride was added to the diet, there was a reduction of the hydrogen-ion concentration, carbon dioxide, and calcium of the blood. The urine showed an increased excretion of calcium and phosphorus. Roentgenograms disclosed very feeble attempts at ossification of the callus.

The authors believe that in Group 2 the "calcium stream" was directed toward the bone and in Group 3 away from it. In conclusion they say, "In brief, this evidence emphasizes the fact that for assimilation of calcium and phosphorus the chyme in the small intestine should be acid, but for the utilization of these elements, the tissue balance should be alkaline."

BARBARA B STIMSON, M D

## INTERNATIONAL ABSTRACT OF SURGERY

Dodd, H. *Geographic Following Fractures (Etiology of Gas Gangrene)*. *Brit J Surg*. 1944. 315.

The author presents two cases of his own and a case seen by Watson Jones in which gangrene of an extremity occurred after a fracture, and tabulates the previously recorded cases, twenty of which were reported in the period from 185 to 1900 six in the author's cases in the period from 1900 to 1935. Most of the subjects were men in the active age. The lower extremity was involved about twice as often as the upper. The fractures most often followed by gangrene were those of the distal third of the femur and those of the proximal half of the humerus. Calcification of the artery was mentioned as a predisposing factor in two cases, syphilis in two, the main artery with thrombosis and tearing of the gangrene for the thrombosis. The time of onset of the gangrene was between three and six days. The most frequent time was the fourth day. Amputation was performed in all but four cases. In the cases in which the outcome was the record of the mortality was 100 per cent. The author calls attention to the fact that in all of the cases seen since the War recovery resulted whereas in seven cases reported in the period from 1900 to 1918 there were four deaths, and of the cases reported before, 900, death occurred in nine out of ten. Dodd discusses the ways in which the blood supply may be interrupted (rupture, thrombosis). If spontaneous, by proximity to bone, or by several branches acting close together the more likely it is to be lost.

He mentions the following eight diagnostic signs: (1) blanching or diminution of the arterial pulse; (2) loss of sensation; (3) loss of movement; (4) loss of sensation; (5) loss of power; (6) hematoma; (7) local tenderness over the blood pressure of the limb as compared with the graphic demonstration of caloric arteries. He states that when such signs and symptoms occur and do not quickly subside the treatment indicated is early operation with repair of the artery if possible. Precautionary sympathectomy above the level of the injury may be done to cause temporary vasodilatation.

BARBAR B. SHAW, M.D.

Casavero M. *An Unusual Location of the First Metacarpal (So it was seen in a human cadaver)*. *Palmer*. 1944. 41. 100.

In a review of the literature Casavero found that a fracture of the first metacarpal bone was very infrequent. In some of the cases reported there were multiple fractures of other digits and some of the dislocations were complicated by fracture. Of 1000 there are reports of only thirty

five dislocations limited to the first metacarpal bone. These were accompanied by involvement of the trapezium and in the majority the dislocation was from a dorsal direction. Palmar and radial dislocations were exceptional.

The case reported by Casavero was that of a boy eighteen years old who sustained an injury to the hand while holding a matchstick which exploded. The lesions consisted of a large lacerated and contused wound involving the soft parts of the palmar and dorsal aspects corresponding to the first interdigital space. The hand to the wrist was swollen and deformed in a linear prolongation toward the base of the first metacarpal. It was held in a position midway between pronation and supination, with slight dorsiflexion. The last four digits were abducted, and slightly rotated toward the ulnar side. Pressure on the carpus was painful. The hand had assumed the position of an anatomical snuff box. Fracture in the region of the first metacarpal had caused excruciating pain. Active movement with dorsal and volar flexion was possible, but passive movement was limited and accompanied by pain. The fingers were hemophilic. Anteroposterior and lateral roentgenograms revealed a dislocation of the base of the first metacarpal bone. Under ether anesthesia reduction was accompanied by traction applied to the thumb, slight movement of the palmar rotation and traction of the fingers, pressure on the dorsum of the trapezium, and compression on the dorsum of the trapezoid. The reduction was completed without difficulty and showed it to be successful. Roentgenograms

The author discusses the pathogenesis, diagnosis, and symptoms of radial dislocation of the first metacarpal bone.

CASAVERO

Henry A. K., and Reynolds, M. *Fracture of the First Metacarpal of the Ipsilateral Ilium*. *Brit J Surg*. 1944. 315.

The authors present a very careful and detailed analysis of all cases of fracture of the first metacarpal. They discovered the fact that they are able to tabulate the literature. Forty-two cases are mentioned, including two which are seen at King's Army Hospital in the period between 1931 and 1935. Three others are mentioned only in the footnotes. The fractures are divided into four groups—first, the shaft, and other femoral fractures; and the second, and age incidence, type of location, cause, treatment, and results are reported in detail for each group.

Most of the fractures of the shaft occurred in young patients. More than half of the patients with such fractures were under twenty years of age. Only four were women. Fractures of the head of the metacarpal are associated with the greatest violence and in four cases are soon followed by death.

# SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

The luxation was reduced in twenty-two cases—in sixteen by closed methods, with good results in eleven, and in six by operation, with good results in four. The results were poorest in the cases of fracture of the neck of the femur. Of ten cases of such fractures, the luxation was reduced in only four. Reduction was accomplished most frequently in the cases of fracture of the head of the femur. The authors say, "It would appear then that if a patient sustains a fracture of the shaft with hip luxation or survives the force that breaks the femoral head a good result may sometimes be got by making early trial of closed reduction."

Of the twenty-two reduced luxations, seventeen were reduced before the fracture had united—twelve by closed methods, with six good results, and five by operation, with three good results.

In six cases of luxation associated with fracture of the head of the femur, the maximum interval between the accident and reduction of the luxation by closed methods was five days. The only long interval was three months in a case in which reduction was effected by operation. In the three cases of successful reduction of a luxation associated with a fracture of the neck of the femur, the intervals between the accident and the reduction were thirty-eight days, ten weeks, and seven months. In the case in which the interval was seven months the reduction was done by open operation. In the cases of fracture of the shaft of the femur the luxations were reduced by closed methods within five days.

In the second part of the article the authors discuss briefly fractures of the femur caused by attempts to reduce luxation of the hip. Twenty-one such fractures are reported—one of the head, seven of the neck, and three of the shaft of the femur.

BARBARA B STIMSON, M D

## Darrach, W, and Stimson, B B Displacements in Fractures of the Neck of the Femur *Ann Surg*, 1934, 100 833

The authors believe that in fractures of the neck of the femur the position of the head fragment should receive more consideration, that a shift or angulation of the neck fragment either forward or backward is usual, and that the relationship of the two fragments to each other is of more importance than the change from the normal position. They are of the opinion that for recognition of the type of the displacement and satisfactory reduction the roentgen exposure in the anteroposterior plane should be supplemented by exposures in the lateral plane. The article contains illustrative roentgenograms and descriptions of the types of displacements found at open operation. The authors are impressed with the frequency of anterior angulation or a shifting forward or backward of the neck fragment in relation to the head, the wide variation in the position of the head fragment, the extreme mobility of the head fragment, especially in cases of subcapital fractures, and the fact that no one standard procedure will accomplish reduction.

BARBARA B STIMSON, M D

# SURGERY OF THE BLOOD AND LYMPH SYSTEMS

## BLOOD VESSELS

Jägerroos, B. H.: On the Early Development of the Vascular System. The Development of Blood and Blood Vessels in the Chorion of Man. *Acta Soc. med. Universitatis Upsalensis* 924, 9 Fasc 4, N 4

The purpose of the investigation reported in this article was to determine whether early embryonic vasculogenesis, including blood formation, occurs in the chorion of man.

The material studied consisted of a series of 26 selected abortive embryos between three weeks and three months of age. Fixation was generally done with Zenker's or Maxmood's solution. Serial sections were made. The chief method of staining was the May-Grunwald-Giemsa procedure.

The findings show that early forerunner stages lead in an unbroken sequence from the undifferentiated chorionic mesenchyme to the undifferentiated later forerunners of the primitive red blood cells. It was possible to distinguish cell strands of the primitive red blood cells, one succeeding the other. The latter cells have the "ichthyoid" and the "saurid" cells because of their more or less distant resemblance to the erythrocytes of the ichthyopodes on the one hand and the saurapodes on the other. When the forerunners of the ichthyoid or saurid cells arrange themselves in rows either a thin fibril of the ground tissue or independent of the latter wall forms around the cell piles thus produced. The blood vessels are formed by the joining of these vessel anlagen into more extensive systems. If the young blood cells do not arrange themselves as described, they develop extravascularily.

The author concludes that in very early embryonic stage (the latter half of the third week) the primitive red blood cells originate chiefly from the mesodermal nuclei of the chorionic trophoblast. Their development always shows the same forerunner stages, each, up to the middle of the second embryonic month, almost always terminate as ichthyoid cells. The saurid cells, which occur before that time in slowly increasing numbers, thereupon rapidly disappearing. By the end of the second month, secondary erythrocytes appear among the saurid cells, and during the third and fourth months these in turn disappear, leaving the secondary erythrocytes a free field. The blood vessels develop from vessel anlagen which are formed, as red blood cells.

The vasculogenetic potentialities, which are almost ubiquitous in quite young embryos, are con-

stantly more inactivated in older embryos, thus leading in the formation of two plainly distinguishable contrasting zones, an active zone and an inactive zone. Finally by the beginning of the fourth embryonic month, the activity in the entire chorionic region is paralyzed and transferred to other keratinized organs which have previously taken over the activity.

Collier, F. A., and Maddock, W. G.: The Function of Peripheral Vasoconstriction. *Ann. Surg.* 934, 40 983

The important part played by the extremities in the dissipation of body heat is not generally recognized. Regulation against overheating is believed to be brought about by vasomotor shift of blood to the surface of the body which favors increased loss of heat by both radiation and evaporation, the latter process being aided by a higher environmental temperature by the sweating mechanism. The more marked and varying degree of vasoconstriction found in the extremities as compared with the rest of the body surface is due to the more important heat-dissipating function of the former.

In the organic type of peripheral vascular disease the primary pathological change is the occlusion of the arteries. The earlier this occurs the greater the degree of vasoconstriction that can be demonstrated. This is logical because the less extensive the process the more nearly normal will be the heat-dissipating mechanism and therefore the more normal the degree of peripheral vasoconstriction. It is common error to interpret all peripheral vasoconstriction as a pathological process. Undoubtedly some of the so-called "superimposed vasospasm, in thromboangiitis obliterans in particular is normal vasoconstriction.

The marked improvement in vasospastic conditions which is brought about by sympathetic ganglionectomy is due simply to interruption of the heat-dissipating function of the extremities. In many instances there is little evidence that the vasomotor system in itself is primarily at fault. Therefore other methods of treatment should be carefully considered before a major operative procedure is carried out on the sympathetic nervous system.

GEORGE A. COLLIER, M.D.

Faxon, H. H.: The Treatment of Varicose Veins by Preliminary High Ligation of the Internal Saphenous Vein with the 1 per cent. Solution of Sclerosing Solutions. *Arch. Surg.* 934, 70 784

This report is based on a series of 7 patients with varicose veins who were treated by ligation of the internal saphenous vein combined with the injection of sclerosing solutions at the Massachusetts

General Hospital in the period from August, 1931 to April, 1933

In many cases of varicose veins of the internal saphenous system the blood flow is reversed in the main trunk because of incompetency of the valves. This fact is readily demonstrated by the Trendelenburg test. Because of the high back-pressure, injection treatment is often not efficacious on account of the difficulty of producing adequate thrombosis and on account of the frequency of re-canalization when adequate thrombosis is produced. In the light of subsequent experience the author concludes from end results in 314 cases of varicose veins treated by the injection method alone which he reported previously that in at least 29.3 per cent of these cases a preliminary high ligation of the saphenous vein should have been done.

He states that in the performance of the operation it is important to divide the vein above its highest branches and at the point where it empties into the femoral vein. If a stump of saphenous vein which includes the remarkably constant 3 highest branches (namely, the superficial circumflex iliac, the superficial epigastric, and the superficial external pudendal veins) is left, the permanent success of the operation is jeopardized because of the almost certain re-establishment of varicosities through the collaterals of these branches. High ligation leaves no stump from which a thrombus can be dislodged later.

From 10 to 20 c.cm. of a solution of 30 per cent invert sugar and 10 per cent sodium chloride should be injected into the saphenous vein distal to the point of division before the wound is closed.

After the preliminary ligation the patient should remain ambulatory and subsequently should be given a thorough course of injections. The number of subsequent injections necessary will, of course, be comparatively few as compared with the number required in cases without preliminary ligation.

The author recognizes the following 4 definite contra-indications to ligation:

1. Varicosities that are compensatory for an inadequate deep venous circulation.

2. An acute inflammatory process in the groin.

3. The presence of hæmolytic streptococci in varicose ulcers, an acute superficial phlebitis of the lower leg, or an extensive inflammatory reaction about an ulceration.

4. Patients temporarily confined to bed, who are liable to develop untoward thromboses with later embolization.

The last 3 of these contra-indications are temporary but the first is permanent.

ARTHUR S. W. TOUTOFF, M.D.

Smithwick, R. H., Freeman, N. E., and White, J. C. The Effect of Epinephrin on the Sympathetomized Human Extremity. An Additional Cause of Failure of Operations for Raynaud's Disease. *Arch. Surg.*, 1934, 29: 759.

The fact that, in animals, structures innervated by the sympathetic nervous system become sensi-

tized to circulating epinephrin following sympathectomy has already been demonstrated. In this report the authors present evidence showing that human blood vessels become sensitized to epinephrin in the same manner following resection of sympathetic ganglia.

Tests in a series of nine clinical cases in which complete sympathetic denervation of extremities was done revealed marked vasospasm in the presence of minute quantities of epinephrin in the circulating blood. The intravenous infusion of a 1:250,000 solution of epinephrin, an amount which causes little change in the normal extremity, is sufficient to lower the surface temperature of the denervated side as much as 15 degrees F. Similar changes take place when the patient's suprarenal glands are stimulated to secrete epinephrin by insulin hypoglycæmia.

Identical vasospastic phenomena, which occur in sympathectomized cats and rabbits in insulin hypoglycæmia, are abolished by suprarenal denervation.

This hypersensitization of the arteries to epinephrin takes place only on degeneration of the vasomotor nerves. It is not present after procaine hydrochloride block or during the first week after operation. From seven to eight days are required for its development. It constitutes a hitherto unrecognized but important cause of unsatisfactory results from operation in Raynaud's disease.

SAMUEL KAHN, M.D.

## BLOOD, TRANSFUSION

Jegoroff, B., and Serdukoff, G. The Treatment of Werlhof's Disease with Seroplaentol, Serum of the Umbilical Cord (Sur le traitement du syndrome de Werlhof, serum du cordon ombilical). *Gynécologie*, 1934, 33: 434.

Werlhof's disease, called also "the essential thrombopænia of Frank" and "purpura hæmorrhagica," constitutes a complex and sometimes serious problem.

The authors review the various theories regarding the cause of the condition. While thrombopænia is one of the chief characteristics of the disease, the authors agree with others that the diminution in the number of blood platelets does not alone explain the disease. The condition of the walls of the blood vessels and of the endothelium of the capillaries also plays an important rôle. Not only the quantity, but also the quality of the blood platelets is of significance. Recent observations suggest that there may be a relationship between the thrombopænia and dysfunction of endocrine glands, particularly the ovaries.

Goudim-Levkowitch, Smirensky, and Hennig have described a so called "menstrual thrombopænia." Hennig found that in some cases the number of platelets decreases from one-half to one-third during menstruation. According to Goudim-Levkowitch, this thrombopænia may be explained by an alteration in the rhythm of maturation of the follicle and insufficiency of the corpus luteum.



Hypertension of the spleen has also been found during the menses. Menstruation may therefore be considered temporary physiological condition of the hemorrhagic diathesis characterized by decrease in the number of blood platelets and prolonged bleeding time.

In 1938 Serdukhov proposed the use of seroplascentol for the treatment of the hemorrhages of V. Elbrof's disease. "Seroplascentol is the serum of the placental blood obtained from the placental end of the umbilical cord following delivery. After special preparation and sterilization it is put up in vials ready for use.

A study of the action of seroplascentol on the organism in a large number of gynecological diseases, deliveries, periparturient diseases, and premature infants showed that it had the following effects:

1. A definite decrease in the osmotic resistance of the erythrocytes of a dynamic character. This decrease occurred within the first hour after the subcutaneous injection of the seroplascentol and persisted for forty-eight hours.

2. A relatively dynamic increase in the thrombocytes varying between 50,000 and 170,000. The greatest increase was observed in twenty-four hours.

3. An increase in the erythrocytoids of the bone marrow. For a period of twenty-four hours beginning with the first hour after the injection there was an increase in the number of erythrocytes. The increase occurred chiefly in granulophylocytes. This reaction is especially marked three hours after the injection.

4. Hemostasis. The injection was followed by an increase in the coagulability of the blood which persisted for twenty-four hours.

5. A leucocytosis. However in cases of leucopenia, it had no therapeutic effect.

6. Contraction of the capillaries.

7. An increase in the calcium and phosphorus content of the blood in certain cases of hypocalcemia and hypophosphatemia.

It therefore produces an increase in the number of thrombocytes, acts on the electrolytes of the blood, stimulates hematopoiesis and erythropoiesis, and exerts a stimulating hormonal influence.

The authors obtained successful results from seroplascentol treatment in 3 cases of hemorrhagic diathesis after all other methods had failed.

The first case was that of a fourteen-year-old girl who was suffering from epistaxis, ecchymoses, and petechial hemorrhages all over the body. A probable diagnosis of essential thrombopenia was made on the basis of the findings of physical examination and on the blood count. Such showed the blood platelets to number 36,000. After unsuccessful treatment with nafcine, seroplascentol was given by daily intramuscular injection. The daily dose was increased from 5 to 10 c.c.m. Altogether 45 c.c.m. were given. The epistaxis, the bleeding from the buccal mucous membrane, and the formation of petechiae and ecchymoses stopped and the number of erythrocytes increased.

The second case was that of a girl twenty years old who complained of vaginal bleeding and ecchymoses and purpuric hemorrhages in the skin. The findings of blood examination were: hemoglobin, 95 per cent, erythrocytes, 3,910,000, leucocytes, 8,100 and blood platelets, 3,350. Treatment by daily intramuscular injections of seroplascentol was begun immediately. The daily dose was increased from 5 to 10 c.c.m. In thirty days, 55 c.c.m. were given. No anaphylactic reaction or increase in the temperature was noted. The bleeding from the gums and skin stopped and the old ecchymoses and petechial hemorrhages disappeared in a few days. To combat the anemia the patient was given transfusion of 300 c.c.m. of whole blood. The day after the transfusion the bleeding from the gums recurred, the patient complained of headache, petechiae appeared over the entire body and the site of the transfusion showed a marked ecchymosis involving the forearm and the bend of the elbow. Following treatment with daily injections of 5 c.c.m. of seroplascentol the hemorrhages ceased completely, the petechiae diminished, and the patient left the hospital in good condition.

The third case was one of melena neonatorum. Three days after the infant's birth profuse hemorrhage occurred from the mouth. Coffee colored material and blood clots were vomited. The hemorrhage persisted for four days and was followed by the evacuation of blood-stained meconium and the appearance of purpuric hemorrhages in the skin. The findings of examination of the blood were: hemoglobin 53 per cent, erythrocytes, 3,600,000, leucocytes, 22,400 and platelets, 204,550. The infant became very weak and anemic. Daily injections of seroplascentol, beginning with 5 c.c.m. were given. Altogether 30 c.c.m. were injected. The hemorrhages from the digestive tract stopped after three days and the petechiae disappeared after eight days.

From these three cases and more than 300 gynecological, obstetrical, and pediatric cases, the authors conclude that seroplascentol treatment is to be preferred to all other methods for the arrest of hemorrhage.

Isaac Andreopoulou, M.D.

Glassé: The Treatment of Hemophilia with O.T.  
10 (Ueber die Behandlung der Hämophilie mit O.T.)  
A. T. 4) 33 Tag d. deutsch Ges. f. Chir. Berlin, 1934.

O.T. is an irradiated product of ergosterin which definitely increases the blood calcium. It has been used with completely successful results in the treatment of postoperative tetany. Although up to the present time research has not shown calcium to play a part in hemophilia, the author tried the use of O.T. in the treatment of four hemophiliacs. In the cases of two of these subjects, who are bleeding at the time they entered the clinic, the administration of from 5 to 10 c.c.m. of O.T. is daily until total amount of from 40 to 50 c.c.m. had been given in the first treatment period. It

attended by entirely satisfactory results. As early as the second day after the beginning of the treatment the bleeding began to abate and by the fourth day it had ceased almost completely. By the seventh day after the beginning of the treatment the patients showed no further tendency to bleed. Under continued treatment the bleeding time and coagulation time returned rapidly to normal. It was surprising to the author that only very small elevations of the blood-calcium level occurred under treatment with such large doses of O T 10.

In the cases of the two patients who were not bleeding when they came under observation the administration of O T 10 restored the bleeding time to normal.

At later examinations of the four hæmophiliacs it was found that under continued treatment with O T 10 the tendency toward hæmophilic bleeding had not returned.

This report is presented with great caution, it being repeatedly emphasized that such a small number of cases of hæmophilia do not constitute positive proof that O T 10 is efficacious in that condition and attention being called to the possibility of poisoning from overdosage of O T 10, which necessitates careful observations of the blood-calcium level.

In the discussion of this report, RIEDER reported a very successful result obtained with O T 10 in a case of severe tetany from sprue. The condition had been present for years and was most evident during the winter months. Although the patient had once been benefited by parathormone, he had failed to respond to this preparation during the past year. When he was referred to RIEDER he was suffering from a very severe diarrhoea (from fifteen to twenty defæcations a day) and the calcium content of the blood was 4.8 mgm per 100 c cm. Within a few days after the beginning of the treatment with O T 10, remarkable improvement was noted. The calcium content of the blood is now normal and the attacks of tetany no longer occur. Under combined treatment with raw apples (as many as three a day) the diarrhoea has diminished. Rieder confirmed Gissel's findings on the basis of two cases of his own.

SCHOEMAKER suggested that a paucity of salts in the blood may be related to the hydrochloric acid content of the stomach. In support of this theory he cited two cases of uncontrollable vomiting. In the first case the vomiting began the fourth day after an operation and blood analysis disclosed hypochloræmia. Following the injection of a hypertonic salt solution, the vomiting ceased. In the second case the urea content of the blood was found increased, but the chloride content of both the blood serum and the blood cells was normal. It was learned that the patient had been suffering for years from achylia gastrica. Therefore he had not been losing any chlorine ions in the vomitus. Following treatment with a buffer solution (totofusin), the vomiting ceased. These two cases show that hypertonic saline

solutions should not be administered until the blood has been examined to determine whether a hypochloræmia or hyperchloræmia is present.

KLAPP said that while the cautery iron is a poor hæmostatic agent, electrocoagulation yielded a brilliant result in the case of a young hæmophilic with a phlegmon of the palm of the hand. Energetic electrocoagulation stopped the bleeding at once. The resulting necrotic crusts were left to separate by themselves. Klapp stated that in the future he will employ both O T 10 and local electrocoagulation in such cases. He emphasized the necessity for care in the administration of O T 10 because of the possibility of toxic accidents. (GISSEL) JOHN W. BRENNAN, M.D.

### LYMPH GLANDS AND LYMPHATIC VESSELS

Zolotukhin, A. A Roentgenological Method of Examination of the Lymphatic System in Man and Animals. *Radiology*, 1934, 23 455

Roentgenological examination of the lymphatic system was begun by the author in 1928. At first, frogs were used. Later it became possible to visualize the lymphatics in rabbits, dogs, and human beings. With the use of substances differing in atomic weight, it is possible to obtain stereoscopic roentgenograms of the arterial, venous, and lymphatic systems.

For visualization of the lymphatics, various substances and combinations of substances were employed. For successful results the substance must produce a contrast, must be very penetrating, and must be in the form of very minute particles or grains. By thorough crushing and grinding for two or three hours, the particles can be reduced to a diameter of from 3 to 5 micra. The author obtained the best results with the use of a 30 per cent solution of collargol injected with an ordinary syringe either subcutaneously or intramuscularly or into the articular cavity of a slightly anesthetized animal. In both man and animals the solution may be injected intracutaneously on the flexor surface of the ungual phalanx. Later, after a large subcutaneous lymphatic vessel has been visualized, the needle may be introduced into this vessel or into the visualized regional gland.

In conclusion the author says that visualization of the lymphatic system is of importance not only from the standpoints of anatomy and physiology, but also for study of the lymph flow in pathological conditions.

EARL E. BARTH, M.D.

Krumbhaar, E. B. Is Typical Hodgkin's Disease an Infection or a Neoplasm? *Am J M Sc* 1934, 188 597

The author reviews the literature on Hodgkin's disease and the theories regarding the nature of the condition. According to the most important theories the disease is (1) an infection of unknown character, (2) an atypical form of tuberculosis, (3) a lymphoblastoma, (4) a megakaryocytoma, and (5) a

disease intermediate between an infection and a neoplasm.

Hodgkin paid little attention to the nature of the disease, and of his seven cases three were cases of other diseases of the lymph vessels. In 1893 Sternberg expressed the opinion that the condition is a form of tuberculosis and recently L'Esperance produced lesions resembling those of Hodgkin's disease with avian tubercle bacilli. Waller has listed twenty-seven facts suggesting a relationship between Hodgkin's disease and tuberculosis. The early stages show an increase of the endothelioid cells of lymph pulp and follicles and also of the lymphocytes, eosinophiles, neutrophils, and plasma cells which is characteristic of chronic inflammation and would be unusual for even a neoplasm of the reticulo endothelial system. The giant cell becomes prominent, and fibrosis and necrosis develop.

Therefore the picture of Hodgkin's disease is that of an endothelioid cell hyperplasia with characteristic Sternberg-Reed and Langhans giant cells, numerous eosinophiles, and other infiltrating cells replacing the normal lymphoid structure. Of forty fatal cases, the typical cell structure was found in thirty-three. No evidence was discovered in these cases to support the theory that the condition is a neoplasm. The lymphoid tumor called by Ewing "Hodgkin's sarcoma" is rare. This is the most important histological finding in support of the theory that the condition is neoplastic. A biopsy and histopathological report should always be made.

For acceptance of the theory that Hodgkin's disease is a neoplastic condition it must be assumed that the characteristic picture is an inflammatory response to the presence of a neoplasm which cannot be demonstrated. The tendency toward metastasis is less marked than in tuberculosis.

On the basis of the unitarian theory of hematopoiesis, Medlar suggests that Hodgkin disease is related to myeloid leukemias and the erythroblastotic dyscrasias, and that it is a megakaryoblastoma rising from bone marrow. However the occurrence of similar cells in experimental tuberculosis supports the theory that the condition is infectious rather than neoplastic.

While a bacterial cause has not been proved, the demonstration that ultramicroscopic material (Sexta filter) from Hodgkin's disease can produce characteristic lesions when injected into rabbits and guinea pigs supports the theory that the condition is infectious.

The author concludes that the evidence is in favor of the theory that Hodgkin's disease is infectious and should be included among the virus diseases. He therefore believes it should be called Hodgkin disease rather than "lymphogranuloma" until the cause is determined. CLARENCE C. KERN, M.D.

Craver L. F.: Five-Year Survival in Hodgkin's Disease. *Am J M Sc* 934: 58 609.

Craver reviews 31 cases of Hodgkin's disease, in 123 of which the diagnosis was proved by biopsy and

in 185 of which it was based entirely on the clinical picture. In 13 per cent of the total number of cases and 68 per cent of those in a back biopsy was done, irradiation was followed by survival for five years or longer. The average age of the patients surviving five years (thirty-four years) was ten years younger than that of the patients who survived only six months or less, but the extremes of age were the same in the 2 groups.

The difference in the survival of the 2 groups was due apparently to differences in the virulence of the disease. However it showed no correlation with the histological appearance of the nodes removed at biopsy. Favorable features were localization to a single area, early thorough treatment, absence of leucocytosis or leucopenia, and a gain in weight after the irradiation. Fever, marked pruritus, and splenomegaly were apparently unfavorable signs.

ELIZABETH CRANFORD

Leucathia, T.: Irradiation in Lymphosarcoma, Hodgkin's Disease, and Leukemia (A Statistical Analysis). *Am J M Sc* 934: 181 6.

Leucathia analyzes the effect of irradiation in a group of 2,125 cases of lymphosarcoma, Hodgkin's disease, and leukemia collected from the literature and 129 cases observed by himself. Rather close agreement was found in the different groups of cases reported from leading institutions in various parts of the world. It may be said that irradiation is the method of choice in all 3 types of lesions.

In lymphosarcoma, five-year survival is obtained in 30 per cent, and ten-year survival or cure is at least from 10 to 15 per cent, of the cases. In the remaining cases the expectation of life is increased from two and a half to three and one-eighth years. The immediate results are often so prompt and decisive that they may be called spectacular. The irradiation must be carried out with penetrating rays (200 kv and a filter of from 1/4 to 1 mm of copper or steel) large doses (a 50 to 100 per cent skin unit dose per field) and treatment of as much of the lymphatic system as possible. The entire abdomen and the mediastinum should be included in the exposure, whether the disease is localized or generalized. By such technique it is not unusual to cover from 16 to 20 large portals with full or nearly full erythema doses within a period of ten or three weeks. After from eight to ten weeks the irradiation should be repeated over the areas of manifest lesions with a dose of about 70 per cent of the skin unit dose and from ten to twelve weeks later third series of irradiations with dose of 50 per cent of the skin unit dose should be given.

In cases of Hodgkin's disease the incidence of five year survival ranges from 15 to 33 per cent, but as most of the patients remain carriers, frequent resumption of the irradiation is necessary. Ten-year survival or cure is obtained in only 4 per cent of the cases at the most. In the cases of patients who die within the first five years, the average expectancy of life is increased from two to three and a half years.

The symptomatic improvement is nearly always marked, but not as spectacular as in lymphosarcoma. As a rule roentgen-ray therapy with penetrating rays (from 160 to 200 k.v. with a filter of from  $\frac{1}{2}$  to 1 mm. of copper or zinc) is preferred, but in some cases favorable results have been obtained with radium packs. The dosage indicated depends upon the general condition of the patient, and the severity of the lesion. Only the diseased areas should be exposed.

In leukæmia, irradiation does not effect a cure and results in only an insignificant prolongation of life—perhaps from one third to one fourth of the natural expectancy which, in the chronic forms of both the lymphatic and the myelogenous type, is believed to be about three and a half years. However, in the chronic forms, it is followed by remarkable symptomatic improvement and an increase of at least 60 per cent in the patient's efficiency throughout the major part of the duration of the disease. In the acute forms not even temporary improvement is noted. While there is virtual chaos concerning the technique of irradiation in this condition, the author regards it as safe and perhaps best to pursue the following course:

1 Lymphatic leukæmia. Irradiate the spleen with either half-erythema doses of medium-penetrating roentgen rays or with smaller doses of harder roentgen rays and treat the enlarged lymph nodes simultaneously with the harder rays by employing the protracted fractional method spaced so as to conform to the changes occurring in the blood formula.

2 Myelogenous leukæmia. Treat the spleen alone with half-erythema doses of medium-penetrating rays or smaller doses of harder rays. The series, which usually should extend over two or three months, should be repeated at shorter or longer intervals, depending on the blood formula. It is harmful to try to reduce the white cell count to normal or below normal.

Leucutia does not include in his article the results of teleroentgen therapy or roentgen-ray therapy with voltages above 200 k.v. He states, however, that except perhaps in certain cases of localized lymphosarcoma in which a higher penetration attainable with higher voltages is necessary, he does not believe such treatment will materially influence the results.

ELIZABETH CRANSTON

## SURGICAL TECHNIQUE

### OPERATIVE SURGERY AND TECHNIQUE; POSTOPERATIVE TREATMENT

Meyer G. Scalping and Its Treatment by Transplantation (*Über Skalpierung und Transplantationsbehandlung*) 934 Miescher W. Dissertation

In spite of all protective measures, skinning or scalping injuries occur repeatedly especially in the cases of women factory workers, as the result of carelessness. When there is no connection of the avulsed tissue with the underlying tissue, the scalping is described as complete, whereas when connecting bridge remains it is described as incomplete or better as flap wound.

The mechanism by which such an injury occurs is easily understood and has been studied experimentally. A rotating part of a machine catches and twists the hair and a powerful pulling force comes into full play against the resistance of the relatively inextensible body. A purely vertical force merely pulls the hair out, but a more tangential pull removes the scalp as well. The direction of the pull is important in the possible preservation of remaining bridge of tissue (scalp pedicle). The site of such pedicle is, of course, always in the area where the effect of the pull was least. The course and extent of the tear depend upon the direction of the tearing force and the differences in the involved tissues. This fact explains injuries which under certain circumstances carry along the aricle and those producing a free pedicle of cervical skin extending some times as far as the seventh cervical vertebra.

If the galea perforation which is easily separated from the periosteum has taken with it shreds of periosteum, abnormal conditions (previous injury down to the bone) must be present or the injury must have been produced by a tangentially shearing force which gripped the entire scalp between the skull and a rough surface and stripped it back in one stroke. Flap wounds of this type on the spheroidal upper surface of the skull are frequent. However skinning wounds do not occur only on the head. Similar injuries of the hands, the soles of the feet, and even of the penis have been reported in the literature.

In addition to the local injury and the associated injuries (fracture, lateral injury, hemorrhage) shock and secondary complications (erysipelas, meningitis, long-continued suppuration with empyeloma and sepsis) are of importance in the prognosis. The injury itself never causes death, but its complications are often fatal. When epithelialization from the outer edges is started life may be threatened by exhaustion if severe suppuration occurs. The frequently made attempt to unite the entire avulsed

scalp is futile because of the poor vascularization of the bed (the periosteum of the upper bone surface) and the thrombosis of the vessels in the edges of the wound. A treatment of the flap with chemical agents can alter this. The prognosis has been rendered more favorable only since the introduction of skin transplantation.

The history of skin transplantation began with the Reverdin procedure in 1890 which, in spite of many defects, was frequently used during the war of 1870-1871. It was not until 1886 and after long experimentation that Thiersch introduced his method by which it is possible to cover even fresh skin defects quickly and almost completely. In this procedure success depends upon exactness of details as elevation of the graft by accumulated blood keeps the graft from taking. Macroscopic examinations (Enderlein, Marchand, Lenz (Garré)) show however that direct union is exceptional. In general there is to be found, between the graft and its bed, a layer of exudate which at first consists of red blood cells among which multiloculated round cells enter from below. After twenty-four hours this exudate is permeated by fibroblasts with large nuclei which constantly increase and thereby form a granulation tissue. In this granulation tissue there appear on the third or fourth day, perpendicular to the firming surface, thin-walled hollow cylinders which represent the beginning of vascular connection between the bed and the graft. The slowly growing epithelium then creeps over the unevennesses of the bed, and by the tenth day the boundaries between the graft and its bed are difficult to distinguish. The thinner the layer of blood between the graft and its bed the faster the healing process, conditions being almost the same as in primary wound healing.

Fixation of the transplanted skin graft occurs by means of the growing across of blood vessels. The first histological changes are manifested as early as the end of the ninth hour by the penetration of leucocytes through the exudate into the connective tissue spaces of the undersurface. After loosening and infiltration, the connective tissue cells take part in the proliferating processes. Most of the vessels degenerate and after the third day newly formed vascular sprouts take over the circulation between the bed and the graft. Reverdin observed the adhesion of bits of skin which are still movable after forty-eight hours. Under such circumstances an osmotic exchange of tissue fluid must play a role in the preservation of the grafts. The survival demonstrated by Enderlein is chiefly of secondary interest. Noteworthy however, is his demonstration of the fact that the superimposed skin can be penetrated by capillaries after eighteen hours.

## SURGICAL TECHNIQUE

The often observed process of separation of the superficial layer (papillary bodies with an epithelial covering), the so called eschar, does not jeopardize the result. The lowest layer with its sweat glands still permits creeping of the epithelium. The separating process seems to be favored by salves and moist dressings. When dry dressings are used (Lexer, Brunner), separation does not take place until the deeper layer has grown fixed and resistant.

On examination several months later the epithelialized area is found slightly red, shiny, and on a level with the surrounding skin. It seldom has normal sensibility. It shows slight tendency to shrink and at first is still scaling. The amount of desquamation depends upon the blood supply, as does also the correction of the differences of level and the mobility of the scar. Because of the presence of elastic elements the scar can sometimes be lifted up in folds. Scar contraction seldom occurs when Thiersch skin grafts are used. Irregular brownish pigmentations, which often persist for years, are due to changes in the blood pigment beneath the graft. Return of sensibility takes a long time. In some cases of large defects sensibility may remain absent. In others it may be limited to the edges of the graft as the nerve fibers apparently grow in from the edges rather than from below.

The thinner the graft the better the union (Garré), the better the adaptation of the graft to the uneven bed. The adaptation of the graft can be improved by the avoidance of empty spaces by sponge pressure. A surface as dry as possible heals best. Therefore grafting should be delayed until the bloody exudate ceases.

Only autoplasmic skin transplantations are successful. All attempts (Lexer) with homoplastic material have failed. "The trouble and pain of a donor are always in vain." Moreover, time is lost. In cases of stripping of the sole of the foot the use of a transplant from the thigh of the other leg or of fat grafts from the buttocks is advisable because of the excessive tenderness of newly formed tissue on the sole of the foot.

Large flap wounds with a wide pedicle should be merely closed over a drain. When the pedicle is narrow, primary reduction of the defect should be done and followed by the use of Thiersch grafts.

In conclusion the author reviews seventy cases of scalping or skinning injuries collected from the literature.

(LAMPRECHT) THOMAS W STEVENSON, JR., M D  
*Arch Neurol & Psychiat*, 1934, 32 68r

Acute postoperative psychoses were first described by Dupuytren in 1819 in reporting a case of "delirium nervosum." Following the advent of antiseptic surgery they received increased attention and in the middle of the century antiseptics were considered an etiological factor. With the development of asepsis, toxic manifestations became less

frequent and anaesthetics came to be regarded as principal factors although pre existing mental disorders, chronic alcoholism, sepsis, fever, dehydration, anaemia, and cachexia were also considered etiological importance.

On the basis of Magnan's ideas concerning degeneracy, the suggestion was made that postoperative psychoses might be due to a constitutional predisposition, the operation being merely a precipitating factor.

Bonhoeffer, recognizing the great diversity of etiological factors involved in the production of psychoses, brought some order by his classification of symptomatic psychoses. To these psychoses Kleist later added postoperative psychoses. In America the importance of infection has been stressed and postoperative psychoses have been linked with puerperal psychoses. In the literature the psychogenic factors have been neglected. Four psychogenic cases carefully studied showed that fear associated with mistrust and depression is a predominating factor while toxic factors are of minor importance.

Fear and depression are often produced by the patient's associates or medical attendants. The activities of medical assistants, the irritation of misunderstanding, and insistence on routine medication all play an important part in the production and perpetuation of fear and depression. When fear is marked and cannot be allayed by ordinary assurance, operation should be delayed if possible.

WILLIAM E SHACKLETON M D

## ANTISEPTIC SURGERY, TREATMENT OF WOUNDS AND INFECTIONS

De Dzielbowski, M S Treatment of Wounds by the Local Application of Whale Oil (Traitement des plaies par application locale d'huile de baleine) *Bull et mém Soc d chirurgiens de Par*, 1934, 26 356

Reports of favorable results from the local application of vitamins to wounds led the author to use whale oil on extensive infected wounds as recommended by Loehr. Whale oil is sterile. Even streptococci and virulent staphylococci do not grow in it. Therefore it does not require sterilization, which would destroy its vitamins.

Loehr reports excellent results in cases of extensive infected wounds, lacerations, and burns.

Thorough cleansing and removal of necrotic tissues is necessary before application of the oil. Treatment with whale oil is superior to ordinary methods with changing of dressings and the use of drains which injure granulations and delay epithelialization, thereby favoring scar formation. In cases of large wounds, especially large wounds of the fascia and tendons, foreign bodies (drains, gauze, and chemicals) and Bier's hyperaemia are contra-indicated. In cases of extensive wounds of the hand it is best to limit suturing to the minimum and treat with an ointment of whale oil plus fixation.

The author uses a 40 per cent ointment of whale oil in vaseline. He states that debridement must not be too extensive. Just ordinary cleansing and removal of dead tissue and foreign bodies should be done. This should be followed by the application of a thick layer of the ointment and immobilization in plaster or starch. The dressing should not be changed for from one to two weeks.

Skat is very tolerant to whale oil in vaseline. No complications such as eczema have been noted after long applications of the oil, even when they have been made in the presence of pus, abscesses, or phlegmons.

When whale oil in vaseline is applied to stumps the scar will be soft. The author has obtained favorable results from its use also in burns. He emphasizes that the dressing should be left on for long periods of time.

JOHN H. GARLOCK, M.D.

Repetto, E. Experimental Researches on the Action of the Ultraviolet Rays in the Healing by Primary or Secondary Intention of Wounds of the Skin, Muscles, and Parenchymatous Organs—Liver and Spleen (*Ricerche sperimentali sull'azione dei raggi ultravioletti nel processo di guarigione per primo e secondo intenzione delle ferite della cute, dei muscoli e degli organi parenchimatosi—fegato e milza*). *Arch. Ital. di Chir.* 1934, 36: 397.

From extensive experiments on rabbits and a review of the literature the author draws the following conclusions:

In cutaneous wounds subjected to their direct and local action, the ultraviolet rays have a favorable effect on healing by primary intention and cause more rapid contraction.

They have no direct effect on healing by primary intention in wounds of muscle.

1. When they are applied beyond the wounded area, they have no effect on wounds of skin or muscle.

2. In wounds of skin exposed to local irradiation with the ultraviolet rays, healing by secondary intention is hastened.

3. The ultraviolet rays have no direct action on the healing of muscle wounds by secondary intention.

4. They have no effect, local or general, direct or indirect, on the healing of wounds of parenchymatous organs—liver and spleen—by secondary intention.

5. The favorable influence on the process of contraction in primary and secondary union of skin wounds is due to vasodilatation and new vessel formation.

6. As no general reaction is noted, the effect on the contraction of wounds must be due to the rays themselves and not to irradiated air or gas secondary to the rays.

JOHN H. GARLOCK, M.D.

Schapiro, C. Post Traumatic Ossifications (*Ossificazioni post-traumatiche*). *Chir. Chir.* 1934, 9: 97.

The author reports 10 cases of post traumatic ossification which were rather unusual as the ossi-

fication occurred, not in the muscles, but in the para-articular tissues, particularly the joint capsule. One of these was unusual also in the fact that the joint involved was the shoulder. The most common site of such ossifications is the elbow.

The first case was that of a man thirty-seven years of age. During the war the patient received two superficial sharp-pointed wounds, one in the right shoulder and the other in the right heel, and on August 9, 1933, he sustained a contusion of the right elbow and a dislocation of the right shoulder in being thrown from a horse. The dislocation was reduced about an hour later without any particular difficulty. After immobilization of the arm for eighteen days active and passive movements were begun. The movements were very painful and markedly limited. Roentgen examination on September 27 showed the joint to be normal, but disclosed, in the triangular space below the joint, between the anterior edge of the humerus and the lateral margin of the scapula, an irregular shadow made up of a number of parts separated by transparent spaces and presenting a prolongation toward the axilla. As the ossification lay very near the axilla, operation was performed to prevent its extension to the axillary vessels and nerves. The ossification was found to involve large part of the joint capsule. The subscapular muscle was not affected. The newly formed bone had the appearance of normal bone. Its removal necessitated detachment of the capsule which was thickened and had become incorporated with the newly formed bone in its antero-lateral part. Recovery resulted with limitation of movement of the shoulder joint. There has been no further new production of bone.

The second case was that of a woman thirty-four years of age who sustained a fracture of the elbow in falling from a bicycle on October 5, 1933. The joint was immobilized for two weeks. At the end of that time movements were limited and painful. Roentgen examination showed the fracture fragment still displaced. In addition to the callus which united the fragment to the head of the radius, there was an ossification on the lateral side of the radius immediately below the head. This was less dense than normal bone and was separated from the cortex of the diaphysis of the radius by transparent line. Operation performed on January 10 showed a mass of newly formed bone apparently originating from the joint capsule, from which it could be separated only artificially and showing only slight connection with the condyle of the humerus and the neck of the radius. The muscles were not involved, but the deep surface of the annular ligament was invaded by the newly formed bone. The ligament was therefore removed together with the remains of the capsule and the head of the radius. In this case operation was performed too recently to allow judgment of the late results.

In conclusion the author says that operation is not indicated in cases of post traumatic ossifications unless there is serious impairment of function or

pressure on nerves, and should not be performed until the ossification has reached its maximum, which requires from six months to a year

AUDREY GOSS MORGAN, M D

Fedorovich, D Treatment of Pyogenic Surgical Diseases with Artificial Gastric Juice *Vestn Khir i pogran obl*, 1934, 33 135

The experiments of Taure, Pavlov, and others proved that the gastric juice has an antiseptic action. It kills the cholera vibron, the typhus bacillus, and the paratyphus bacillus in fifteen seconds. Its bactericidal action is greatest when its acidity is between 60 and 70. In experimental investigations, Rozansky found the best antiseptics to be brilliant green, rivanol solution, and artificial gastric juice. These experiments were controlled by investigations in 200 clinical cases. One hundred of the patients (25 of whom had suppurations) were treated with iodine solution and 100 (10 with suppurations) with gastric juice. Vanovsky treated 30 cases of complicated fracture with gastric juice. In most of them the treatment was begun after six hours. Suppuration occurred in only 3 cases. Of 50 cases of phlegmons and osteomyelitis which were treated with gastric juice after operation, the temperature became normal on the following day in 35 and on the third day in 12, whereas in a control series of 50 cases of phlegmons treated by ordinary methods the temperature did not become normal until the fifth day or later. When gastric juice was used the average time of treatment was nine days shorter.

The action of the gastric juice is due not only to its bactericidal property but also to its ferments which accelerate autolysis of the tissues.

The formula for artificial gastric juice is as follows: dilute hydrochloric acid, 18 c cm, pepsin, 20 gm, distilled water, 100 c cm, and glycerin, 5 c cm.

M SILBERBERG, M D

Ritter, C The Importance of Bacteria in Surgical Infections (Die Bedeutung der Bakterien fuer die chirurgischen Infektionen) 58 Tag d deutsch Ges f Chir, Berlin, 1934

In disagreement with the prevailing theory of the predominant importance of bacteria in the development and treatment of surgical suppurative infections, Ritter believes that the chief factor is, not the bacteria, but the necrosis of the tissues. He states that the necrosis is not the result, but the cause, of the suppuration. With its elimination the suppuration disappears even though a considerable number of bacteria remain. Accordingly, treatment should be directed chiefly to removal of the necrosis. The cauterization of phlegmons by Bier's method causes healing, not by killing the bacteria, but by removing the necrosis. Its action is similar to that of the excision of crushed wound edges by the method of Friedrich, which renders primary suture possible, and to that of the radical removal of burned vesicular epidermis, which is followed by smooth healing

under a dressing. Even when treated with cod liver oil, a wound continues to suppurate until the necrosis is eliminated. For the phrase "ubi pus ibi evacua" should be substituted the phrase "ubi necrosis ibi elimine." The elimination of necrotic tissue may be hastened even without operative removal. This may be accomplished by stasis since, in the presence of hyperæmia, the still viable tissue is under favorable conditions of nutrition so that the bacteria are deprived of their power of colonization, the reparative processes are strengthened, and the destroyed tissues are more rapidly separated and absorbed or thrown off.

As treatment, Ritter therefore recommends rest obtained with the use of the closed plaster cast which he first suggested in 1916 for the treatment of infectious processes including subacute septic-suppurative gunshot wounds of joints, suppurations of bones and soft tissues, and bone fistulae. This cast places the wound at rest by preventing irritation. As a result, the suppuration is greatly reduced and the weakened body is enabled to concentrate its powers against the most important irritant, the necrosis.

In conclusion Ritter says that the theory that necrosis is caused by bacteria and their toxins has not been proved. Numerous facts indicate that, as in suppurations from trauma and burns, so also in suppurative surgical diseases such as acute osteomyelitis, appendicitis, and cholecystitis, primary mechanical and chemical effects and nutritional disturbances may produce necroses in which bacteria colonize secondarily.

(RITTER) LOUIS NEUWELT, M D

Florey, H W, Harding, H E, and Fildes, P The Treatment of Tetanus *Lancet*, 1934, 227 1036

The authors state that if recovery from tetanus occurs it is complete, that is, there is no residual muscular impairment. It is evident, therefore, that the toxin can be eliminated completely, the nerve cells being left intact. Antitoxin, even in large doses, is apparently incapable of removing toxin already fixed to the nerve cells, but the toxin is probably slowly oxidized. The authors believe that if the patient can be saved from the exhaustion caused by prolonged spasms and can be supplied with sufficient water and food, it should be possible to keep him alive long enough to permit oxidation of the toxin. They therefore tried prolonged anæsthesia and administered curare to paralyze the muscular contractions, keeping the patient in a Drinker respirator.

Most of the studies reported in this article were of an experimental nature. Cats and rabbits were used. After the administration of an initial lethal dose of tetanus toxin, the animals were kept alive and free from convulsions by continuous anæsthesia. However, they all died of bronchopneumonia because of the great sensitivity of their pulmonary tissue.

In a series of experiments in which curare was used it was found that this drug is capable of par-



ually bolishing the muscular paralysis. The great disadvantage of its use is paralysis of the diaphragm.

On the basis of their experiments and clinical observations the authors suggest the following treatment for human tetanus:

1. Quiet to exclude external stimuli.
2. The administration of large doses of tetanus antitoxin, preferably by intravenous injection.
3. Excision of the original wound.
4. Control of convulsions and rigidity by the continuous administration of nitrous oxide and oxygen, and careful use of curare with the Drinker respirator always at hand.

JOHN H. GARLOCK, M.D.

Bary, L. Anti-Tetanus Vaccination (*La vaccination anti-tétanique*). *Presse méd. Par.* 1934. 4

Vallee and Bary made the first anti-tetanus vaccination in 1917. Bary emphasizes the responsibility of the physician in determining when the use of anti-tetanus serum is indicated and discusses the dangers of sera of bovine origin.

As physician for a large railroad company Bary vaccinates against tetanus all railroad employees who volunteer. The employees are offered also anti-typhoid and anti-diphtheritic treatment. The serological record of each employee is kept on a card.

The handling of packages and animals from all parts of the country makes tetanus infection to be especially feared. Bary points out that army horses are regularly vaccinated against tetanus, but not the men who use them. He urges general anti-tetanus vaccination.

JOHN H. GARLOCK, M.D.

Scheer H. The Prophylaxis of Tetanus and Serum Sickness (*Tetanusprophylaxe und Serumkrankheit*). *Schweiz. med. Wochenschr.* 1934. 70

Although most physicians are in favor of prophylaxis, the problem is still a subject of dispute, especially since Doezler recently opposed prophylaxis. It is the danger of serum sickness that makes many physicians hesitate. In sensitive individuals and those who have received repeated injections serum sickness usually develops in from four to seven days after the treatment whereas in persons not previously treated it usually does not develop until after from eight to eleven days. The clinical manifestations—headache, fatigue, fever, arthritis with pruritus, transient edema, joint swellings—usually last only for from one to three days. Occasionally however they persist for five days or longer. Anaphylactic shock with death occurs once in 50,000 injections. Measures for the prevention of serum sickness include:

1. The use of serum from a different species (bovine serum) for re-injections.
2. Desensitization by the method of Benedek and the use of intracutaneous tests. If after the intracutaneous administration of 0.1 c.c.m. of serum diluted 100 times, in physiological salt solution a redness appears about the skin wheel allergy is present.

4. The use of high-grade and refined sera. Inquiry among physicians disclosed that the allergic effect of the sera differed according to the source of the serum. Statistics based on 1,000 cases which were obtained by questionnaire sent out by the Swiss Accident Insurance Institute showed that a general serum sickness occurred in about 10 per cent, and that the results cannot be much improved by the use of a commercial serum. It is a striking fact that the re-injection of pasteurized Pasteur serum is followed by reaction considerably less frequently. With regard to the question as to whether the use of high-grade and refined sera causes serum reactions less frequently the evidence is insufficient. (Pp. 14.) JOHN H. GARLOCK, M.D.

Bussello, A. Serum Shock and Serum Sickness Following Tetanus Vaccination and Its Treatment (*Serumchock und Serumkrankheit nach Tetanusvaccination und ihre Behandlung*). *Deutsche med. Wochenschr.* 1934. 137

Bussello defines serum shock and serum sickness as a reaction between antigen (foreign protein) and the antibodies formed against it. He states that every serum contains albumin and globulin. The latter is broken down into globulin which is dissolved with difficulty and pseudo globulin which dissolves easily. Bussello interprets the mechanism of anaphylaxis as a process in which the former is transformed into the latter in the form of fine precipitates which is capable of producing obstruction in the capillaries.

Serum shock occurs immediately after the injection, usually when a repeated intravenous injection is given to an individual who has received previous injections and the period between the injections is short. It causes pallor, chills, vomiting, circulatory failure, collapse, dyspnea, convulsions, and possibly death. It is very infrequent. As a rule it occurs when, in prophylactic vaccination, very large doses are given intravenously because of the development of tetanus. Bruce reported that serum shock occurred only twice in 1,000,000 prophylactic inoculations, but 49 times with 15 deaths in cases of therapeutic inoculations. The treatment should include the intravenous injection of 5 c.c.m. of cardiacol, the subcutaneous injection of 5 c.c.m. of 1:1000 solution of adrenalin, large intravenous infusions of warm 5 per cent sodium chloride solution and artificial respiration. Von Stark combated shock in one case by light ether narcosis.

Prophylactic injections should also be given subcutaneously and slowly. In the case of persons previously inoculated, bovine serum is preferable (Behring). The serum should be given while the patient is still under narcosis for treatment of the wound. Desensitization is not very successful. An injection of 0.1 or 0.5 c.c.m. of serum is given intramuscularly 4 or 5 after three or four hours. Larger dose is given (Benedek).

Serum sickness is frequent. If cases showing the slightest arthritis the site of the injection are

included, its incidence is 40 per cent. As a rule it develops in from seven to nine days, but in persons who have been treated previously it develops in four or five days. The symptoms vary from mild to very severe. The most important are urticaria, oedema, joint swellings, diarrhoea. These usually subside in four or five days and leave no sequelæ. Polynuritis and paresis of the arms are rare. In children the symptoms are always very much more severe than in adults and dyspnoea occurs because of oedema of the glottis. Therefore the patient must be watched carefully. However, tracheotomy has never been necessary in the author's cases. The treatment indicated includes dry powder treatment, the administration of heart stimulants, and the intramuscular injection of from 5 to 10 c.cm. of calcium glycuronic acid. However, this treatment does not affect the duration of the condition, it merely relieves the spasms and other symptoms. Buzello has not found Rother's autohæmotherapy successful. On the other hand, he has obtained good results from the subcutaneous injection of an additional 5 c.cm. of the tetanus serum at the onset of the serum sickness. In his small number of cases the serum sickness did not become more severe or recur over a prolonged period of observation.

In conclusion the author says that the prophylactic injection of tetanus serum should not be withheld because of the possibility of serum shock and serum sickness, but the patient should be advised of the possibility of these conditions in advance.

(FRANK) JOHN H. GARLOCK, M.D.

### ANÆSTHESIA

Crampton, H. P. Factors Other Than Anæsthetics Affecting Anæsthesia. *Proc Roy Soc Med*, Lond, 1934, 28, 91.

The author limits himself to a consideration of the psychological factors which favor or militate against the induction of smooth anæsthesia. In discussing the reaction of various types of patients to anæsthetic agents he states that persons with well-disciplined minds take anæsthetics well whereas those with undisciplined minds and spoiled children take them poorly. "Those who boldly admit their fear are as a rule quicker in reaching a smooth anæsthesia than those who suppress it. It is surprising how few people are in a state of real panic at the zero hour." Alcoholic addicts require more anæsthesia than persons not addicted to alcohol and recover quickly. "Cheery alcoholics" take anæsthetics better than others. In the author's cases alcoholic addicts are given alcohol "neat" before operation. Crampton says, "If he drinks or smokes to excess, by all means begin a cure after anæsthesia rather than before."

With regard to the anæsthetist, Crampton discusses "stage management, judgment, and personality." He states that without these attributes the anæsthetist is "a mere retailer of dope." Under "stage management" he mentions rest before in-

duction of the anæsthesia, tranquillity of mind, bodily comfort, position, and preparation of the patient, and punctuality of the operation. Under "personality" he discusses briefly the Art of anæsthesia.

G. DANIEL DELPRAT, M.D.

Sise, L. F. The Technique of Intratracheal Anæsthesia. *Surg Clin North Am*, 1934, 14, 1049.

The author describes the technique of the induction of intratracheal anæsthesia with particular regard to the technique of direct laryngoscopy and intubation. He states that the intratracheal method is of great value and, if correctly carried out, is quite simple and easy.

The anæsthesia is an important factor influencing the ease of intubation. Practically any of the anæsthetic agents—cocaine, nitrous oxide, ether, or avertin—may be used, either alone or in a combination. Intubation is greatly facilitated if the agent chosen and the plane of depth are such that the cords are well relaxed and wide apart, if the anæsthesia is of sufficient duration to permit intubation before sensation returns to the larynx and the cords become approximated, and, when intubation is done through the mouth, the jaw is sufficiently relaxed to open easily.

The type of anæsthesia which meets these requirements best is induced with avertin and local anæsthesia of the larynx.

The avertin need be given only in sufficient amount to put the patient sound asleep. For the induction of local anæsthesia the author sprays the larynx with 10 per cent cocaine through an airway after the patient is under the influence of the avertin.

J. FRANK DOUGHTY, M.D.

Barlow, O. W., Fife, G. L., and Hodgins, A. C. Avertin in Pre-Anæsthetic Medication. A Survey of 1831 Surgical Anæsthesias. *Arch Surg*, 1934, 20, 810.

The authors reviewed a series of 1,831 avertin anæsthesias induced on a general surgical service since 1930. The avertin was given in doses of from 50 to 100 mgm. per kilogram following the preliminary administration of morphine and atropin and was supplemented by several types of general anæsthesia.

The dose of the hypnotic was adapted to the age and general condition of the patient. Patients from one to eighteen years of age received maximal doses—from 90 to 100 mgm. per kilogram—and aged patients as a rule received minimal doses. The optimal average dose for adults appeared to be from 80 to 85 mgm. per kilogram.

Ninety-two per cent of patients came to the operating room asleep. Occasionally—as a rule following medication with small doses—movements persisted. On their arrival in the operating room the patients were usually relaxed and, although satisfactorily analgesic, still responded to painful stimuli. The pulse rate was variable, occasionally wide oscillations on either side of the normal rate.

## INTERNATIONAL ABSTRACT OF SURGERY

were noted. The median rate increased slightly when small doses were given, but was either unchanged or slightly depressed by maximal doses. The extremes of age were associated with the least stability. The blood pressure and pulse rate bore an inverse relation. The median blood pressure decreased 18 per cent, with a maximal range of from 5 per cent above to 40 per cent below normal. Changes were minimal in young patients and maximal in aged patients. The respiratory rate, as either unchanged or accelerated by medication, if a significant depression of respiration occurred, the respiratory rate increased. The volume was rendered more shallow. The minute volume was depressed in proportion to the dose of the hypnotic administered. The decrease varied from 1 per cent when 50 mgm of avertin were given, to 4 per cent when maximal doses were given. In exceptional cases, doses of 50 mgm reduced the minute volume more than 5 per cent.

The induction of anesthesia was rapid. From 20 to 85 per cent of the anesthetics were good, the remainder fair or poor. Poor anesthetics were more frequent after small doses of avertin and when the avertin was supplemented with ether than when it was supplemented by some other general anesthetic. In local anesthesia following medication movements were not infrequent when avertin was given in doses as high as from 50 to 100 mgm per kilogram. Patients operated upon for thyroid, brain, or gynecological conditions responded less satisfactorily than patients operated upon for other conditions. Young patients reacted better than aged patients and males somewhat better than females.

The pulse rate was accelerated from 20 to 40 per cent above normal during the anesthesia. The degree of change was variable but generally proportional to the dose of the hypnotic administered under constant conditions as regards age and the supplementary anesthetic.

The blood pressure increased during the course of the operation and partially or completely compensated for the fall that occurred following premedication. The increase was greatest after minimal doses of avertin, and was distinctly less in aged patients than in younger patients given similar medication. The blood pressure of patients operated upon for thyroid conditions increased significantly greater degree than that of patients operated upon for other conditions. The increase in the diastolic pressure was usually greater than the accompanying systolic change.

The respiratory rate increased from 50 to 60 per cent during the anesthesia. The volume remained more shallow than normal. The respiratory depression apparent following premedication was partly counteracted by the anesthetic procedures. The margin of safety was narrowed and the response to carbon dioxide reduced. The disturbance diminished somewhat as the effects of the avertin wore off. Postoperatively the respiratory rate remained slightly above normal for from one to two

hours. The minute volume became either normal or approached the level of premedication. Esophageal cyanosis developed.

Postoperative restlessness was observed in from 50 to 60 per cent of the cases. It was not troublesome from the nursing standpoint, but from 50 to 100 per cent of the restless patients received medication. The incidence of restlessness bore an inverse relation to the hypnotic dose administered. The complication was less frequent in and thus in younger persons. Little difference in this respect was noted among the various surgical groups. At least part of the postoperative movements were due to the general anesthetic used. The reaction seemed to be exaggerated by ether whereas movements were minimal in the presence of local anesthetics.

The duration of the postoperative sleep bore little relation to the dose of avertin administered. The period of postoperative unconsciousness was significantly influenced by the nature of the anesthetic supplement and the duration and severity of the operative procedure. It was greatest here the local anesthesia. Both young and aged patients appeared to be somewhat more sensitive to avertin than normal adults.

Nausea and emesis occurred in the postoperative period in approximately 50 per cent of the patients subjected to general surgical operations. Their frequency was greatest in patients operated upon for gall bladder conditions. While the correlation was not close, they appeared to be more frequent in females than in males and somewhat more frequent when small doses of the hypnotic were given than when maximal doses were administered.

A moderate degree of renal damage occurred following the administration of avertin. Specimens of urine taken twenty-four hours after the operation showed albumin in 3 per cent of the cases and casts in 7 per cent. The excretion of the specimens taken from forty-eight to seventy-two hours postoperatively showed no albumin or casts, but excreted only traces of albumin and casts persisted for several days. Traces of sugar were noted not infrequently but were considered unimportant. However, as the operation was followed by marked glycosuria which persisted for more than ten days.

Undesirable reactions following medication with morphine, atropine, and avertin included rather significant fall in the blood pressure and definite depression of the respiratory volume, which accentuated the respiratory depression, which was accentuated depression of respiration was apparent during the anesthesia as the anesthetic margin was reduced. One patient became hysterical and another vomited shortly after the administration of the hypnotic.

Shock reactions of greater or less degree were observed in approximately 10 per cent of the cases either during the operation or in the postoperative period. In half of these the blood pressure became imperceptible and treatment was required.

be prepared to defend his choice in case of failure. Irradiation treatment requires a comprehensive knowledge of clinical behavior, pathological varieties of tumors, and radiophysiological phenomena related to tumors.

A radioresistant tumor is defined as a neoplasm which cannot be completely sterilized without serious damage to the surrounding normal tissues. A small radioresistant lesion can be cured by intense local irradiation, but if radionecrosis results in the tumor bed, surgery would have been better. However, there are tumors possessing an intermediate degree of radiosensitivity which can be eradicated by interstitial irradiation without radionecrosis. An excellent example of this type is carcinoma of the breast.

Repeated irradiations over a prolonged period of time seem to increase the radioresistance of a tumor and render normal cells radiosensitive. On the other hand, it has been found that irradiation continued over a considerable period of time may be more adequate than the use of a greater intensity for a short time. In this respect the saturation method of Pfahler resembles to some extent the technique of Coutard. The results obtained by Coutard and Berven in carcinoma of the tonsil have markedly advanced the irradiation treatment of these lesions. The author describes Coutard's technique. He, himself, has adopted the technique of telerradiumtherapy which differs from the Coutard method in utilizing the more penetrating gamma rays of radium and more fully extending the principle of continuity of irradiation. The pack is used twice daily on consecutive days without interruption for a period of from twenty to sixty days. The collection of data regarding this treatment will serve for a comparison between the biological effects and clinical results of X-rays and gamma rays. Continuity of irradiation may be one of the most important factors in the sterilizing of neoplasms. Other problems to be considered are the total interval during which the irradiation is best given and the intensity of the irradiation.

A JAMES LARKIN, M D

Bertolotto, U. Roentgen Therapy of Gynecological Inflammations (La roentgentherapie nelle forme infiammatorie ginecologiche). *Radiol med*, 1934, 21 1103

The author reports briefly fifty-three cases of various types of gynecological inflammation which were treated by roentgen therapy. He used a Koch and Sterzel super-universal apparatus with four valves. The focus-skin distance was 30 cm, and the filter, 0.5 mm of copper and 3 mm of aluminum. The tension varied from 120 to 180 kv, but in the majority of the cases was 150 kv. The fields in the lower quadrants of the abdomen varied from 150 to 400 sq cm. The half-value layer was 0.6 mm of copper up to 120 kv, 0.65 mm from 120 to 150 kv, and 0.9 mm from 150 to 180 kv. Hammer's dosimeter was used. The doses were small. Doses of 50 r or less repeated three times in twelve days were

given in cases of acute inflammation with circumscribed exudate and doses of from 75 to 100 r repeated two or three times in cases of pelviperitonitis and parametritis with extensive exudate. In a number of cases doses as low as 20 r yielded excellent results.

Excellent results were obtained in 37 per cent of the cases and good results—marked improvement in the general condition, abolition of pain, and a decided decrease but not total disappearance of exudate—also in 37 per cent. The best results were obtained in cases of acute puerperal infection. This is contrary to the experience reported by some gynecologists who advise against using irradiation in acute febrile cases. The author did not find the results any poorer in cases of inflammation due to gonorrhoea. There were only two cases in which the inflammation was aggravated. One special advantage of the treatment is the rapid and complete control of the pain which makes it possible to institute local treatment. Several days are gained in this way. The author cites a case in which the irradiation brought about such marked improvement in the general condition and such reduction of the exudate that a cyst could be diagnosed and operated upon successfully.

Roentgen irradiation effects a cure considerably more quickly than medical treatment. In the cases reviewed the roentgen treatment was associated with medical treatment and rest, which were also factors in the cure.

Roentgen irradiation is indicated particularly in septic puerperal conditions. In such conditions and the acute forms of inflammation of the adnexa it should be given as early as possible. It is less effective in chronic cases. Some gynecologists recommend temporary castration in these cases. In pelviperitonitis with extensive exudate the results are not so good and caution is necessary particularly if the general condition is poor. The results are not good in endometritis and cervicitis. Probably the intra-uterine sepsis keeps up the inflammation in these conditions. Pregnancy is not a contra-indication. In the author's opinion there is no definite proof that the treatment is injurious to the child.

AUDREY GOSS MORGAN, M D

Desjardins, A. U. A Classification of Tumors from the Standpoint of Radiosensitivity. *Am J Roentgenol*, 1934, 32 493

As Ewing and many others have shown, variations in the radiosensitivity of neoplasms are caused by a number of factors. Among these may be mentioned impairment of the blood supply, a disturbance of the anatomical relations which probably acts mainly by interfering with the circulation and lymphatic drainage and inducing the formation of connective tissue, cachexia, which is evidence that the patient's resistance to, and ability to hold his own against, the malignant process has been almost or entirely exhausted, sepsis, the influence of which is not understood, and previous irradiation.

# PHYSICO-CHEMICAL METHODS IN SURGERY

## ROENTGENOLOGY

Cutler AL. The Problem of Radioresensitivity. *J Am Med Ass* 1934, 3, 104

The author presents a critical review of the problems of radioresensitivity from the standpoint of biological, pathological, and clinical knowledge, problems which are of concern to the pathologist, surgeon, and the radiologist. He states that while formerly squamous cell carcinoma was thought to be radioresistant by most investigators, the French school showed that the resistance of this tumor was due entirely to technique and dosage. Squamous cells are resistant to short intense exposures, but squamous carcinoma can be readily sterilized by long-continued low intensity exposures adequate in amount. Cutler cites numerous instances in which a squamous carcinoma stated to be radioresistant by the pathologist was readily destroyed by proper irradiation. He states that in expressing an opinion regarding radioresensitivity which the surgeon may follow in his decisions with regard to treatment the pathologist assumes a great responsibility. As the microscopic structure of a tumor is only one of a group of factors indicating radioresensitivity consultation between the pathologist and radiotherapist is of importance. In the determination of the radioresensitivity of various lesions the morphological structure must be correlated with other factors, including the physiological, pathological, and clinical history of the tumor. A knowledge of the life history of radioresensitivity. Numerous instances indicate that the purely histological factors alone are inadequate to indicate or explain the response of tumors to irradiation therapy.

The choice between surgical and irradiation treatment of a given tumor is often difficult. The principal factors influencing the decision are operability and radioresensitivity. The values of various clinical findings as indices of operability is the subject of wide differences of opinion. The determination of the radioresensitivity of a given tumor must be based on clinical experience, pathological data, and the findings of experimental investigations. A radio-sensitive tumor is defined as a neoplasm that can be completely destroyed by correct irradiation without permanent damage to the surrounding normal structures. Its eradication can be accomplished by selective irradiation or by caustic irradiation. Selective irradiation sterilizes the cancer cells without causing serious damage to adjoining tissues, but is possible only when the difference between the radioresensitivity of the cancer cells and that of the surrounding normal cells is considerable. Most tumors fail to meet this requirement. Nevertheless, the

radioresensitivity of tumors is the underlying principle of radium therapy and differentiates the action of radium and X-rays from such methods as electrocoagulation. Caustic irradiation differs from selective irradiation in that it not only destroys the tumor but also seriously injures the surrounding normal tissue. It is applicable only to radioresistant tumors that are not too extensive. As extensive injury to adjacent normal structures results in radio-necrosis, it is the aim of radiotherapy to produce complete sterilization without radionecrosis. Even more is of the opinion that radioresensitivity is determined of the tumor than by any other factor. According to this theory extrinsic factors are of secondary importance. General cooling of the tissues increases radioresistance whereas heating seems to increase radioresensitivity.

Most carcinomata arising from the epidermoid structures of the skin and mucous membranes—namely the skin, lips, oral cavity (tongue, tonsils, alveolae, larynx, pharynx, cervix, and vagina)—are radioresistant. On the other hand, adenocarcinoma, melanoma, osteogenic sarcoma, and fibrosarcoma are radioresistant and carcinomata of the breast occupy an intermediate position. Of the epidermoid carcinomata, the adult basifying squamous form is more radioresistant than the transitional form. Lympho-epithelioma is highly radio-sensitive.

The author emphasizes that radioresensitivity does not mean curability and radioresistance does not imply incurability. Intense irradiation may destroy resistant lesions adequately and cause a swelling by prompt recurrence or the formation of distant metastases. It is emphasized also that the complication of metastases should not be considered in connection with radioresensitivity. Papillary lesions are radioresistant though their histological structure may indicate resistance. Instances illustrating this principle are cited. Superficial papillary adenoma or low-grade adenoma malignum of the body of the uterus can be eradicated by intra-uterine and external radium therapy. The therapeutic test—namely the response of the tumor to irradiation—remains the most accurate guide to the radioresensitivity of the neoplasm.

The outstanding successful results from irradiation therapy have been obtained in cases of epidermoid lesions of the skin and mucous membranes. Aside from radioresensitivity, success in the treatment depends upon the extent of the disease, the correctness of the irradiation. When the radiotherapist attempts to treat lesions which are amenable to surgery he accepts grave responsibility and must

not lethal in a quantity of  $3.3 \times 10^{-6}$  mgm until the tissue had passed through twenty-nine subcultures. This fact is of importance as it shows that with smaller quantities a longer time is required to bring about the lethal effect. By comparison with exposures of  $2 \times 10^{-6}$  mgm for nine days as compared with 300 mgm for six hours it was found that the lethal action of the radium is much greater when all three rays are used in contact with the tissue than when the tissue is exposed only to the gamma rays.

A. JAMES LARKIN, M.D.

McCoy, H. A. Necrosis Following Radium Treatment. A Preliminary Report. *Med J Australia*, 1934, 2, 14.

The investigation reported was based on the records of the Radium Clinic of the Adelaide Hospital, Adelaide, Australia.

McCoy states that important contributing factors in the development of necrosis following radium treatment are unsuitable filtration and concentration of the radium. In the cases reviewed, unscreened surface applications of radium were frequently employed in the treatment of lesions of a type which subsequently have been treated by interstitial or distance methods. Monel metal or steel needles were burned in cases in which, today, only platinum needles are employed. McCoy reports illustrative cases of unsuitable filtration and concentration. He states that in cases of large tumors adjacent to, or involving bone or cartilage the development of necrosis is inevitable because of the large dose necessary for treatment of the tumor.

In several of the cases reviewed the decrease in radium sensitivity of tissues involved by central infection was apparent. McCoy says that failure to remove infected teeth preliminary to treatment of

the primary lesion in cases of buccal carcinoma may be responsible for unfavorable results. In several of the cases reviewed active syphilis was found with necrosis following radium treatment. However, a positive Wassermann reaction was not invariably associated with delay of healing or necrosis. In the case of a patient suffering from active and extensive pulmonary tuberculosis the routine treatment of a small epithelioma of the lip was followed by necrosis and continued growth of the tumor. In several cases of epithelioma of the back of the hand necrosis followed treatment with embedded radium needles screened by 0.5 mm of platinum. It was later found that surface treatment with the use of the same needles and with moulds yielded much better results. Similarly, interstitial treatment of lesions near the nose and ear was improved by the use of moulds. In a small series of cases the interstitial treatment of an epithelioma of the neck was followed by delayed healing. The fibrous character of the subcutaneous tissues in this area seems to have been the underlying cause. Illustrative cases are cited.

In conclusion the author says that the minimum filtration in the treatment of squamous-cell epithelioma should be 0.5 mm. of platinum. If the lesion is adjacent to, or involves bone, 1.0 mm of platinum should be used when interstitial treatment is employed. When bone or cartilage is involved, surface technique with the use of moulds has advantages over the interstitial method. An attempt should be made to eliminate infection before radium treatment is undertaken. Syphilis should be treated before and during radium treatment. In certain lesions, particularly those involving bone, necrosis is inevitable if radium treatment is to be effective in destroying the neoplasm.

A. JAMES LARKIN, M.D.

The effect of previous irradiation on the radiosensitivity of a tumor may be practically nil or very great, according to the thoroughness with which the tumor was treated and the number of times the course of treatment was repeated. A decrease in radiosensitivity from previous irradiation is probably the result of the gradual secondary proliferation of connective tissue which follows the destruction of malignant cells (and, if the dose has been sufficient, of some of the connective tissue cells themselves) as well as the increasing inhibition of mitotic activity of the malignant cells from repeated irradiation and a decrease in the blood supply from injury to blood vessels and the accumulation of connective tissue.

Another factor is the time factor of irradiation. By this is meant the time over which given dose or course of treatment is spread. This depends on whether the dose or course of treatment is given at a single sitting, whether the total dose or course of treatment is divided into large fractions given in a number of sittings within a small number of days (from three to seven) or whether the dose or course of treatment is divided into small fractions given in a large number of days (from seven to thirty-five). When the total dose is given in one sitting or in from three to seven sittings on successive days there is little difference in the effect, but when the same dose is divided, as for example, into twenty-one fractions given on as many successive days, the effect on the neoplasm is much less and to produce the same effect the total dose must be much larger. However with the exception of secondary infections (sepsis) all these factors combined are less important than the natural radiosensitivity of the varieties of cells.

In conclusion the author says that the practical value of the classification of tumors given in this article will be doubted only by those who are not familiar with the natural radiosensitivity of different kinds of normal cells and their neoplastic derivatives. The importance of such knowledge is accorded to be greatest with reference to the radio-sensitive tumors because the difference in the relative sensitiveness of such neoplasms is often sufficient to make it possible to forecast the probable effect of treatment and, with adequate experience, to make an absolute identification. This applies also to some of the tumors classed as moderately radio-sensitive.

McIntosh, H. C. Changes in the Lungs and Pleura Following Roentgen Treatment of Cancer of the Breast by the Prolonged Fractional Method. *Radiology*, 934, 3 358

Recognition of pleuropneumonitis following roentgen treatment of the thorax for cancer of the breast and intrathoracic malignancies is of importance because of the morbidity and possible mortality resulting from this condition and because of the difficulty of differentiating between irradiation changes and advancing metastasis, especially in cases in which more treatment for palpation of the metastases is contemplated.

The author reports four cases showing varying degrees of pleuropneumonitis following thoracic irradiation and gives estimations of the depth doses. Four other cases are discussed briefly. A possible influence of age and arteriosclerosis on the abnormal pulmonary and pleural changes is suggested. The factors in the roentgen treatment were as follows: 200 kv (peak) 30 ma. a skin target distance of 30 cm. filtration by 0.5 mm. of copper and 2.75 mm. of aluminum, 62.5 r per minute, and 1 thousand erythema dose (T.E.D.) equal to 500 r measured in air.

While the author agrees with Desjardins, Green or Christie, Merritt, Coe, and others that the effect is quantitative he believes that in all cases reported hereafter the possible influence of age and arteriosclerosis should be considered, and that the justification of this risk as regards primary morbidity and mortality and the hazard of intercurrent diseases so vulnerable irradiated lung must be decided for each case.

JOSEPH K. NARAY, M.D.

#### RADIUM

Plum, F. B., Victor, J., Brillman, N. and MacDonald, D.: The Action of Radium on Tissue Culture. *Am. J. Cancer* 934, 21 351.

The object of the study reported was to determine whether or not radio-active materials have a direct stimulating action on embryonic tissue in vivo. Radio-active salts taken into the body are easily deposited in the skeleton and gradually cause the destruction of bone cells.

The experimental work is described in detail with special attention to the amounts of radium used and the technique of the exposure. Both hanging drop and flask cultures were employed. Tissue from fibroblasts obtained from the heart and epithelial tissue from the iris of fowl embryos of seven and eight days' incubation were used. Leucocytes and bone marrow were taken from fowl less than year old. Comparisons were made between the original tissue, the experimental tissue, and the controls. The results of exposures to various minute amounts of radium are shown by tables and diagrams.

Metabolic studies relative to the oxygen consumption were made in the case of fibroblasts, leucocytes, and bone marrow. From the observations in the three series the conclusion is drawn that the presence of 5 x 10<sup>-6</sup> mcgm. of radium does not affect the metabolism of leucocytes, fibroblasts, or bone marrow. This is true even when irradiation from the alpha, beta, and gamma rays is employed.

In conclusion the authors state that the experiments described yielded no evidence of direct stimulation by the amounts of radium to which the cultures were exposed. However they showed that irradiated cultures did not recover from the shock as rapidly as the control cultures. This was evidenced by their inability to withstand temperature changes and differences in fowl plasma. Radium was

not lethal in a quantity of  $3.3 \times 10^{-4}$  mgm until the tissue had passed through twenty nine subcultures. This fact is of importance as it shows that with smaller quantities a longer time is required to bring about the lethal effect. By comparison with exposures of  $2 \times 10^{-4}$  mgm for nine days as compared with 300 mgm for six hours it was found that the lethal action of the radium is much greater when all three rays are used in contact with the tissue than when the tissue is exposed only to the gamma rays.

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In conclusion the author says that the minimum filtration in the treatment of squamous cell epithelioma should be 0.5 mm of platinum. If the lesion is adjacent to, or involves bone, 1.0 mm of platinum should be used when interstitial treatment is employed. When bone or cartilage is involved surface technique with the use of moulds has advantages over the interstitial method. An attempt should be made to eliminate infection before radium treatment is undertaken. Syphilis should be treated before and during radium treatment. In certain lesions, particularly those involving bone necrosis is inevitable if radium treatment is to be effective in destroying the neoplasm.

A. JAMES LARKIN, M.D.



# MISCELLANEOUS

## CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Symmers, D  
934, 86 7 Status Lymphaticus. *Am J Surg*

The author defines status lymphaticus as a combination of hereditary constitutional anomalies, among which are certain peculiarities of configuration with preservation or even hyperplasia of the thymus at an age when involution of the thymus is to be expected, hyperplasia of the lymphoid cells in the spleen, intestine, and elsewhere, changes in the distribution of hair, hypoplasia of the vascular system, developmental deficiencies in the genitalia, and incidentally visceral defects of uncertain occurrence and irregular distribution.

Although status lymphaticus is compatible with long life, sudden death may result from anaphylaxis caused by sensitization due to the instability of the lymphoid tissue or from the spontaneous rupture of a the blood pressure. The lymphoid instability seems also to lower the threshold of resistance to infection. It should be possible to recognize status lymphaticus during life from its clinical aspects. In the male these include a delicate texture of the skin, enlarged pubic hairs, accentuation of the facial and snarling and by poplarea of the penis. In the female the graceful characteristics of the bodily configuration are accentuated. Of 4,000 autopsies performed at the Bellevue Hospital, New York, status lymphaticus was found in 140 (6 per cent). It was discovered 6 times more often in males than in females.

Of 8 cases of all developed status lymphaticus studied, the thymus was hyperplastic in all, the tonsils were likewise affected in 50 per cent, and hyperplastic lymphoid follicles were found in the intestinal tract and spleen in 85 per cent. The lymph nodes showed similar hyperplasia with an increased number of lymphocytes tending to bring about rearrangement of structure through an increase in the size and number of the germinal follicles. In cases in which sudden death occurred these nodes showed necrotic changes characterized by change in the shape of the cells and the discharge of nuclei into the intercellular spaces. Germinal follicles are replaced by whorl like collections of spindle cells of connective tissue type among which are large polyhedral cells resembling degenerated large lymphocytes. According to Symmers, these changes indicate that sudden death in status lymphaticus is related to an anaphylactic reaction caused by the sudden release of nucleoproteids formed as the result of the destruction of numerous germinal follicles.

Cerebral hemorrhage is not uncommon in young, non-syphilitic subjects of status lymphaticus. It is due to the rupture of hypoplastic cerebral arteries occurring spontaneously or caused by apparently trivial trauma, physical strain, or intense excitement. Although sudden deaths in status lymphaticus have been ascribed to pressure of the enlarged thymus on the trachea, anatomical evidences of tracheal compression or suffocation have never been observed after death.

Attention is called to the frequency of status lymphaticus in persons who have attempted suicide, drug addicts, criminals, epileptics, and the hysteric. Its occurrence in association with exophthalmic goiter and in persons who are emotionally unstable is common. Apparently the hereditary anatomical defects of persons with status lymphaticus render them more susceptible than normal individuals to the influences precipitating exophthalmic goiter. The anatomical signs and symptoms of chlorosis suggest that in girls with status lymphaticus the form of anemia is incidental. The author calls attention to the great frequency of status lymphaticus in fatal cases of acute infectious diseases such as diphtheria and epidemic meningitis.

In many cases of recurrent attacks of appendicitis of an apparently mild type microscopic examination of the removed appendix has revealed hyperplasia of the germinal follicles, scleroses, and even obliteration of the appendix in the absence of signs of an inflammatory exudation. *Marion M. J.*

Critchley M. Some Aspects of Pain. *Brit M J*  
934, 86

Attention is called to the limited scope of the various biochemical and metabolic changes that have at times been regarded as the effects of pain. Many of the data obtained by animal experimentation are not applicable to the study of pain as processes of human mental activity. Pain as personal sensory experience, its existence in the individual depends on his word alone. As obvious difference exists in the pain reaction of individuals to an apparently identical stimulus. Even in the same individual the response varies under different conditions due to such factors as attention or associated rage, fear, anxiety, or despair. The persistent pain usually dominates the victim's consciousness, causing inability to concentrate upon physical or mental activities. When states of severe pain are to be anticipated, marked psychological adjustments are commonly in terms of color, may occur. The discussion includes the problem of the effect of one pain upon another the sensation of relief

from pain, pain as a pleasure sensation, and the relation of pain to sexual stimulation

WALTER H. NADLER, M.D.

**Blalock, A.** Shock Further Studies with Particular Reference to the Effects of Hæmorrhage  
*Arch Surg*, 1934, 29 837

In experiments on dogs the induction of profound anæsthesia for an extended time by the administration of sodium barbital or ether was associated with definite alterations in the tissues of the body. In some instances hæmorrhage into the lumen of the intestinal tract occurred. The alterations were slightly more marked when ether was used than when sodium barbital was used.

The alterations in the tissues found following death from hæmorrhage after the use of sodium barbital, ether, or procaine hydrochloride in the spinal canal for the induction of anæsthesia were only slightly less marked than those found following death from trauma when the same anæsthetics were used. However, the blood pressure remained at a low level for a longer time in the experiments in which trauma was produced.

In a comparison of the results of experiments performed under sodium barbital, ether, or spinal anæsthesia, in some of which death was caused by hæmorrhage and in others by trauma, it was found that the quantity of fluid in the injured extremity in the experiments in which trauma was produced was approximately equal to the amount of blood withdrawn in the experiments carried out to determine the effects of hæmorrhage.

Maintenance of the mean arterial pressure at approximately 70 mm. for three hours by the injection of acetylcholine or by increasing the intrapericardial pressure was associated with marked alterations in many of the tissues of the body. The mucous membrane of the intestinal tract became red and hæmorrhage occurred into the lumen of the tract.

Removal of blood in small amounts at frequent intervals from animals under local anæsthesia in such a manner that the blood pressure was at a low level for as long as possible preceding death was associated with capillary congestion and dilatation in most of the organs and hæmorrhage and necrosis of the cells in some of them. Hæmorrhage into the lumen of the intestinal tract was observed in most instances.

Maintenance of the blood pressure at a low level for several hours prior to death by combined removal of blood and introduction of blood was associated with marked alteration in the tissues. The changes appeared to vary directly with the length of time the blood pressure remained depressed. The animal's own blood was used for the replacement and coagulation was prevented by defibrinating the blood or placing it in a solution of sodium citrate or heparin. An increase in the concentration of the red blood cells occurred in more than half of the experiments.

In other experiments in which local anæsthesia was used the blood pressure was reduced by hæmorrhage

and was kept at a fairly constant low level for several hours by removing additional blood or by introducing blood by the direct method from a suitable donor. Death occurred in all of the experiments despite the fact that slightly more blood was introduced than was removed. The gross and microscopic changes in the tissues were marked. Free blood was present in the lumen of the intestinal tract. An increase in the concentration of the red blood cells occurred in all of the experiments.

The average quantity of blood remaining in the pleural and peritoneal cavities following removal of the organs was approximately the same in the experiments in which death was produced by hæmorrhage and in those in which death was caused by trauma to an extremity.

With regard to the differentiation of hæmorrhage and traumatic shock the following statements are frequently made:

1. Hæmorrhage is associated with a decrease in the concentration of the red blood cells, while shock is associated with an increase.

2. Death following hæmorrhage is associated with an anæmic appearance of the tissues, while after death following shock the tissues show hæmorrhage and congestion.

3. The low blood pressure resulting from hæmorrhage is promptly corrected by blood transfusion, while shock is not greatly benefited by transfusion.

The author's experiments show that shock associated with an increase in the concentration of the red blood cells, capillary congestion, hæmorrhage in the tissues, and a negative response to the transfusion of blood can be produced by hæmorrhage alone.

SAMUEL KAHN, M.D.

**Dévé, F.** Intermediate and Transitional Pathological Forms Between Hydatid Echinococcus and Alveolar Echinococcus (Bavaro-Tyrolienne) in Man. *Australian & New Zealand J. Surg.*, 1934, 4 99.

The author states that the exact nature of echinococcus alveolaris is not known. Dew and others claim that all hydatid lesions are the same and that polymorphism is due to parasitic variations. Posselt, on the other hand, emphasizes the parasitic specificity of echinococcus alveolaris. The zoological and histological arguments have not been substantiated and animal experimentation has failed to produce the alveolar process. In the classical alveolar hydatid disease the findings of pathological examination are the same whether the liver, lung, brain, or bone is involved, and the alveolar characteristics are retained whether metastasis occurs by lymphatic paths or the blood stream.

The author discusses the pathological findings in three cases which he claims disprove the theory of a parasitic duality of the echinococcus. The first was a case reported by Orth and Schmetz in which, in addition to a hydatid cyst of the spleen as large as a man's head, numerous smaller cysts such as occur in multilocular echinococcus cysts were found.

Dévé believes that this case showed a definite metamorphosis from the hydatid echinococcus into the alveolar form. The second case was one reported by Weichselbaum, Kolisko, and Pomerai to which a primary coincident development of alveolar and cystic hydatid echinococcus occurred in the heart without involvement of other organs. The author claims that on re-examination he found an intimate mingling of the hydatid and quasi-alveolar lesions which renders duality of the lesions unlikely. He believes they were a series of transitional forms. The third case was one reported by Dew in which (he Dew showed among the fundamental alveolar lesions unusually large cystic cavities filled with hydatid liquid. Here an alveolar echinococcus gave rise to a quasi-hydatid alveolar formation. Apart from the special example of bovine echinococcus, transitional cases of this kind have been rare, but the author believes they will be recognized more frequently when all cases are studied more carefully.

Dévé concludes that these three cases have firmly established the existence of transitional forms between hydatid echinococcus and alveolar echinococcus in man, and confirm the theory of the parasitic unity of the echinococcus.

CLARENCE C. REED, M.D.

Wallgren, A. The Value of Calmette Vaccination in the Prevention of Tuberculosis in Childhood. *J Am M Ass* 1934 43 541.

The author presents the results achieved up to the present time in an experimental antituberculous vaccination of human beings. The vaccine he used is composed of an originally virulent strain of bovine tubercle bacillus which, by certain methods of cultivation, has been rendered very nearly avirulent.

With regard to the safety of such vaccination he states that in a careful and critical study of the available literature he found that, up to the present time, not one of the million children who has been vaccinated have suffered any evident harm from a carefully prepared and carefully employed vaccine. Of 230 children vaccinated by Wallgren himself, only 2 have died. One died of epidemic meningitis and the other of acute pneumonia. In neither was any evidence of tuberculosis found.

The results of the prophylactic vaccination introduced by the author in 1927 are shown in a chart. In the 3 five year periods immediately preceding 1927 the absolute number of deaths from tuberculosis per 1,000 children in Gothenburg was 4.5, 4.8 and 5.2 respectively. In 1927, out of transition in which only a relatively small number of children were vaccinated, it was 3.0. In the five year period beginning with 1928 when the principles advanced by the author were strictly applied, it was 2.4. In 1933 the first year of the next five year period, it was only 0.3.

Wallgren concludes that the course of the mortality curve constitutes definite proof that the principles he has followed have been efficacious in the purely practical application of antituberculous vac-

cine as a prophylactic measure against tuberculosis in the children of the community.

HARVEY F. TAYLOR, M.D.

Donnelly, H. H., and Nicholson, M. M.: A Study of Vaccination in 500 Newborn Infants. *J Am M Ass* 1934 103 269.

Smallpox vaccination of newborn infants is a safe procedure. Its complications are negligible, its influence on growth and nutrition is insignificant, and it is seldom followed by fever.

The skin reaction tends to be slight in extent, and when Leake's method is used leaves behind only small superficial scars. Adjustment between the potency of the virus and the inoculation technique may insure successful results from the first vaccination in at least 90 per cent of the cases.

Vaccination of newborn infants has been practiced successfully since Jenner's time. The high resistance of newborn infants to successful results may be due to the resistance of growing young tissues, but possibly also to other factors.

Active acquired immunity may develop promptly and may persist well over a year, probably longer.

In the cases of foundlings in Russia which were vaccinated shortly after birth, observations continued until the subjects were twenty-five years old revealed a very slight morbidity in the 17 small-pox epidemics occurring in the period between 1876 and 1886.

In conclusion the authors state that vaccination at birth is a practicable means of factoring protection against smallpox in a large group of women in which it is most needed when the group itself is prone to do without this protection for itself and for the community until it is forced to obtain it at school age.

BURTON KURT, M.D.

Mahler, G. E., and Vantine, J. H.: The Treatment of Epitheliomas of the Skin. *Radiology* 1934 3 54.

Cancer never begins in normal tissue. Cancer of the skin nearly always develops very slowly and is seldomly the difference in the condition between one month and the next being slight. Because of this fact the patient has a false sense of security. Most, particularly those of the pigmented variety, occur singly or in large numbers. It is probably true that not more than 1 in 2,000 becomes malignant. If a mole is not treated skillfully, then the change from the benign to the malignant condition occurs. Extensive metastases are likely to result. Therefore it is best to remove all moles, especially pigmented moles, a precautionary measure. It is advisable also to remove all warts, particularly senile warts, and any abnormal crista, fissures, or chronic ulcers. These can be eradicated under local anesthesia at one sitting by desiccation or electrocoagulation.

Large warts often develop epitheliomas which usually begin as small fissures or craters and then gradually spread. This type of epithelioma is squamous-celled. As rule removal of the crust

scar by electrothermic dissection is advisable. Moles, warts, scars, and epitheliomata in scars are usually not treated successfully by irradiation alone, and are best destroyed by electrocoagulation.

Epitheliomata of the skin may occur as single or multiple lesions, but are usually single. They develop as a rule on the exposed parts of the body. Not all epitheliomata of the skin are of the basal celled type. Fifteen per cent are of the squamous celled variety. Since squamous celled carcinoma may give rise to metastases, not only the local lesion, but also the associated lymphatics must be treated. The treatment of epithelioma of the skin depends in great part on the size, depth, duration, and location of the lesion. Between 70 and 90 per cent of epitheliomata of the skin can be cured by irradiation either with radium or the X-rays. This is the method of choice in cases in which scarring is objectionable. When scarring is not objectionable, the area around the lesion should be electrodesiccated, the bed of the lesion then destroyed completely, and this treatment followed by a full erythema dose of X-rays or surface applications of radium. If, on biopsy, the carcinoma is found to be squamous celled, the neighboring lymphatic glands should be treated with filtered irradiation and high voltage X-rays.

In Bowen's disease, the patient may have as many as 100 epitheliomata, varying in size from that of a pinhead to that of a fist. Under general anesthesia most of the lesions may be removed at one sitting.

Basal celled epitheliomata are of 2 types. The typical lesion of one type seems to develop as a papilloma which may be of varying size. In lesions of the other type there is very little overgrowth of tissue, but ulceration occurs, producing the rodent ulcer. When treated early, the rodent ulcer can be easily cured by radium or X-ray irradiation or electrocoagulation. When it has extended into the muscle or deeper, its treatment is very difficult. Occasionally the advanced lesions can be arrested by irradiation, but recurrences may develop. As a rule it is best to destroy the deep lesion completely by electrocoagulation. Even if bone is involved, the bone area should be destroyed and then the destroyed area should be resected down to healthy bone or the destroyed bone allowed to sequestrate.

In the treatment of epitheliomata of the skin it is usually necessary to give a total of from 4 to 10 erythema doses. Most failures are due to insufficient treatment. The incidence of recurrence is increased when soft rays are employed. SAMUEL KAHN, M.D.

**Bucalossi, P.** A Histological and Critical Study of Myxomata and Myxomatoid Tumors (*Mixoma e tumori mixomatoidi. Studio istologico e critico*) *Clin. chir.*, 1934, 10, 831.

The author reports two cases of myxoma, in one of which the tumor occurred on the antero-interior surface of the thigh of a man sixty years of age and in the other on the forearm of a woman fifty-five years of age. In discussing the histological findings in these cases in detail he reviews the whole question

of the nature of myxomata and the differences between these tumors and other neoplasms which have undergone myxomatous degeneration. He states that myxomata may develop in a mucous tissue which is completely differentiated or in one which is not yet completely differentiated. Of most importance from the practical point of view is the fact that while the morphological appearance of the two varieties of tumor is the same, their clinical course may be very different. Those that develop from completely differentiated tissue are benign, while those that develop from incompletely differentiated tissue may become malignant. As it is impossible to differentiate between them histologically, the only safe course is to consider all myxomatous neoplasms potentially malignant and operate upon them radically. AUDREY GOSS MORGAN, M.D.

**Lumsden, T., Macrae, T. F., and Skipper, E.** The Direct Demonstration of Anti-Cancer Bodies in the Serum of Animals Immune to a Homologous Tumor. *J. Path. & Bacteriol.*, 1934, 39, 595.

In a series of articles published by one of the authors (Lumsden) during the past ten years, strong and cumulative experimental evidence of the existence of specific anti cancer bodies was presented. Although this evidence has been widely accepted as adequate, a few observers have remained unconvinced because the presence of the anti-cancer bodies had never been demonstrated in an animal immune to a homologous tumor (e.g., a rat immune to Jensen's rat sarcoma) or in the blood of an animal in which a tumor was regressing. This difficulty has been surmounted as the presence of anti-malignant-cell bodies can now be shown directly and conclusively by application of the serum of rats immune to Jensen's rat sarcoma to tissue cultures of Jensen rat sarcoma cells under the conditions described by the authors. In the authors' opinion the essential factor in immunity is the power to produce antibodies rather than the actual presence of antibodies.

The antibodies are formed when the immune animal has need of them as, for example, after an implantation of Jensen rat sarcoma. An immune rat which has not been injected with Jensen rat sarcoma for a period of many weeks has only a very low titre of antibodies. In every one of more than forty rats immunized against Jensen rat sarcoma a high titre of anti cancer bodies was demonstrable in the serum within one week after the last immunizing inoculation. Anti-cancer bodies are not demonstrable in the sera of normal rats or of rats bearing a progressively growing tumor. Rats in which a tumor is regressing develop *pari passu* anti cancer bodies in their sera. These anti-cancer bodies have an affinity for cancer cells alone and are quite harmless to normal tissues. They are toxic to malignant cells of any variety, not only to those used as antigen. The ability to produce the anti cancer bodies when they are required is an essential factor in acquired, and probably also in natural, tumor immunity.

JOSEPH K. NARAT, M.D.

Gandolfo, A.: Roffo's Test in Cancer: Statistical Results of 11,000 Cases. *Am J Cancer* 1934, 46:1

In 1925, Roffo, in experimenting on sera of normal and cancerous rats, discovered that if 3 drops of 1 per cent neutral red in distilled water are added to 1 c.c. of fresh clear serum the serum will become red if it was obtained from a cancerous animal and yellowish if it was obtained from a normal animal.

At the Congress of the Latin-American Confederation for the Study of Cancer which was held in Montevideo in 1930, the results of 2,841 tests made on 17,000 patients at the Institute of Experimental Medicine at Buenos Aires were reported.

The percentages of positive results obtained by various investigators are summarized by Gandolfo as follows:

	Cancer	Other diseases
Roffo	82.9	
Capizzano	70	
Astraldi	90	
	90	
Pilar and Ercias	61.5	
Araya and Herman	6.4	
Carreras	75	
Caffari and Alkierstein	74	1
Thomas	60	6
	73	
Berie	43	39
Baye	90.0	30
Acorda	7	9.8
Endo and Pilar	64.4	
Hilakowicz	30	77
Roffo and Correa	83	
Carreras	65.4	1
Correa Ariza	40	
Moretti and Rivas	80	
Rosa-Cruz-Sotoca	1	24.6
Bosch	61.6	4

Of the 1,000 tests reviewed by the author, 4,18 were made in cases of cancer and 6,78 in cases of other diseases. The cases of cancer are classified according to the duration of the disease, the type of the reaction (whether it was strongly positive, positive, weakly positive, or negative) and the location of the cancer.

In the cases of non-cancerous disease the incidence of positive reactions ranged from 5 to 8 per cent and averaged 6.37 per cent.

In the cases of skin cancer in which the results of the test are poorest, the reaction was positive in 28.41 per cent of 1 tests.

Of 810 cases of cancer of the mouth, the result was positive in 52 per cent.

Of 675 cases of cancer of the gastro-intestinal tract, it was positive in 6.6 per cent.

Of 321 cases of cancer of the respiratory tract, it was positive in 75 per cent.

Of 9 cases of cancer of the liver it was positive in 44.44 per cent, and of 13 cases of cancer of the pancreas, it was positive in 46.15 per cent. In all cases with jaundice it was negative.

Of 477 cases of cancer of the breast, the reaction was positive in 50.33 per cent. In the case of 64 patients operated upon in other hospitals and showing no recurrence, it was negative.

In 40 cases of cancer of the male genito-urinary tract—cases of cancer of the bladder, prostate, kidney and testicle—the incidence of positive results ranged from 60 to 80 per cent, but in the case of cancer of the penis it was 44 per cent.

Positive results were obtained in 68.33 per cent of the cases of uterine cancer, 78.94 per cent of those of ovarian cancer, 57.14 per cent of those of cancer of the vagina, and 50.62 per cent of those of cancer of the vulva.

In cases of cancer at other sites, particularly cases of internal neoplasms, the percentage of positive results was high.

Roffo's test is not specific, but is of value as an auxiliary method for the diagnosis of cancer.

Although negative results do not exclude the presence of cancer, positive result should induce continued investigation to discover the growth, since in 6,78 tests the incidence of false positive results was only 6.37 per cent.

Roffo's test has yielded a high percentage of positive results in cases of cancer of the uterus, ovary, bladder, stomach, intestines, liver, pancreas, lungs, and mediastinum and in cases of osteosarcoma, all of which generally present diagnostic difficulties in the conditions in which it gives the 10 per cent percentage of positive results biopsy is usually possible.

WILLIAM E. SCHLESINGER, M.D.

Kodera's Indications for Early Operation (Under the Indication for Fractoperitoneal) *Schweiz med Wochenschr* 1934, 14:8

In many different surgical procedures the best functional results with minimal operative danger are obtained if the operation is performed early. On the basis of his extensive experience the author lays down the rules which he has found of value.

The indication for early operation in appendicitis is generally recognized. However an exact diagnosis is required because in cases of resected abdominal abscess, gonococcal peritonitis, typhus, renal and ureteral stones, ascotomies, and pneumonitis, operation would not only be useless but might be harmful. The operation should be limited to cases in which the suspicion of appendicitis or of an abdominal condition requiring surgery is sufficiently justified.

Localized abscesses should be opened only when the condition becomes progressively worse, the temperature continues to rise, the pain on pressure becomes more severe and the leucocytosis increases. The appendix should be removed only when it is readily accessible.

In pneumococcus peritonitis the demonstration of the organism in the blood or the vaginal secretion supports the diagnosis. Early operation is not to be recommended, but the abscesses should be opened and pneumococcus serum should be administered later.

In acute pancreatic necrosis early operation does not appear to influence the process materially.

In paranephritic suppuration there is no need to hurry operation.

Gall-stone disease should not be compared to inflammations about the cæcum. In the former condition the mortality is essentially higher and operation does not always result in definite cure. Enderlien recognizes the following indications for operation on the gall bladder: (1) severe empyema, (2) hydrops (because of the danger of the development of empyema), (3) icterus (after two or at least three weeks, because of the danger of cholæmia), (4) social indications, and (5) more remotely, the danger of the development of carcinoma.

In ulcer of the stomach and duodenum operation is indicated early only in case of perforation, otherwise it is indicated only after one or two well conducted ulcer treatments have failed. The older the case (ulcera callosa), the better are the results of extensive resection.

In empyema, operation should always be preceded by a number of paracenteses. Suction by the Perthes method accelerates the expansion of the lungs.

In cases of abscess of the lungs, the focus remains limited for several weeks and operation may be delayed for six weeks without anxiety.

In cases of enlargement of the prostate early operation is not urgent. Only a continuous catheter life and residual urine constitute indications for intervention, and these only when supplemented by determinations of the renal function, residual nitrogen, and indican.

In Basedow's disease operation may be done when a two-months' course of internal treatment or of irradiation treatment (which in itself is not without danger) has failed to cause noteworthy improvement.

In cases of epidural and subdural hæmatoma, early operation is life saving.

Umbilical hernia is an urgent indication for early operation, as is also incarcerated, congenital inguinal hernia.

The imperfectly descended testicle may be left without operation until the ninth year of life.

Early operation is not recommended for phimosi, epispadias, hypospadias, or exstrophy of the bladder.

Hælip should be operated upon as soon as the nutrition of the child permits it, and cleft palate should be corrected surgically at the end of the second or third year of life.

Wry neck should not be operated upon before the end of the second year of life.

Operations for syndactyly should be delayed until the sixth year of life.

(A BRUNNER) JOHN W. BRENNAN, M.D.

Goyanes J. Air and Fat Emboli and Their Surgical Importance. (Sobre las embolias de aire y grasa y su importancia quirúrgica). *Actas Soc. de ciruj. de Madrid*, 1934 3: 179.

Air embolism may occur in any surgical operation. It is most common in the "dangerous zones" in the

lower part of the neck where bubbles may enter the jugular vein, especially if the vessels are displaced by large tumors. Caisson disease is an example of general air embolism. In attempted abortion and placenta prævia, air may enter the placental vessels. The use of hydrogen peroxide in wounds may cause air embolism.

The clinical picture of air embolism due to only a small amount of air is the sudden development of asphyxia, palpitation, stabbing pain in the chest, and dizziness. Cerebral symptoms are loss of consciousness, loss of vision, and contractions and pareses of the muscles.

Air cannot enter the veins unless the pressure in the veins is less than that of the atmosphere. On forced inspiration pressure is lowered in the thorax, the blood from the large veins rushes into the heart cavities, and the pressure in the peripheral veins is reduced to less than that of the atmosphere. The vessels of the neck are surrounded by aponeurotic fascia which keeps them from collapsing, thereby favoring the entrance of air into these vessels when they are injured. The patient's position is important. If his head is lowered in injury of the vessels of the neck, the negative pressure in the veins becomes positive and hemorrhage occurs instead of the entrance of air into the veins. This has been demonstrated in experiments on animals and is of great value in prophylaxis.

Death in air embolism is variously explained. Kleinschmidt attributes it to a combination of overdistention of the right auricle by air and obliteration of the capillaries and arterioles of the lung.

In addition to general stimulating treatment, direct aspiration of the air from the heart may be tried in grave cases. In cerebral embolism little can be done besides the administration of stimulants to raise the blood pressure with the object of dissolving the air. Other methods of raising the pressure are energetic flexion of the thighs on the pelvis and ligation of all four limbs.

Fat embolism is obstruction of capillaries and small arteries by fat droplets. It generally follows fractures. It is best prevented by careful handling of patients with fracture and the avoidance of long transportation of such patients if possible. Fat embolism may develop within a few hours or more than seventy-two hours after a fracture. In severe cases death is soon caused by blocking of the capillaries of the lungs. The symptoms in these cases are a feeling of great oppression in the chest, intense dyspnea and cyanosis, and, at times, the expectoration of blood. If the patient does not die soon, kidney and brain symptoms develop as the result of the entrance of fat into the capillaries of these organs. When a patient enters the hospital in a condition of stupor following an accident causing fracture a differential diagnosis must be made between shock, concussion of the brain, and fat embolism. The blood and urine should be tested for fat and the eye grounds examined. In the differentiation of fat embolism from shock and con-

cussion of the brain which come on at once, the free interval in cases of fat embolism is of aid. Fever may occur in fat embolism, but is not characteristic. In animals the temperature generally falls.

In the treatment the intravenous injection of adrenalin may improve the circulation in the pulmonary arteries. The author advises catheterization of the right auricle and the injection of adrenalin into the heart. On the basis of the theory that the fat is carried by the lymphatics, Williams advises opening of the thoracic duct. The operation is simple, but the later closure of the fistula is often difficult. From experimental and clinical observations Wegelin has come to the conclusion that the fat is carried by the veins of the fractured limb. The classical method of treatment by heart tonics and diffusible stimulants should not be given up. Scharoff recommends inhalations of carbon dioxide.

ALBERT GORE MORGAN, M.D.

#### SURGICAL PATHOLOGY AND DIAGNOSIS

Gabrielli, S. The Takata-Ara Reaction in Surgical Conditions (*La reazione di Takata-Ara negli animali di interesse chirurgico*). *Arch. Ital. di Med.* 334, 38.

The author carried out the Takata-Ara test on the serum of about 100 patients with various surgical conditions. In primary or secondary disease of the liver or the extrahepatic biliary passages, and especially in mesenchymal lesions of the liver the

reaction was often positive. In the various forms of cirrhosis it was always positive, even in the presence of ascites, except when the lesion was of only moderate severity. In patients with diseases of the liver it was always negative in the presence of jaundice. The author attributes this fact to the presence in the serum of biliary components, which in a certain concentration may inhibit flocculation. In renal, gastro-intestinal, and respiratory diseases the reaction was positive less often than in hepatic diseases.

Operative control and histopathological studies carried out on some of the patients tested led to the view that the positivity of the test is dependent upon the presence of hepatic changes of an inflammatory or degenerative nature. Gabrielli concludes also that it is related to a disturbance of the proteolytic power of the liver since he observed that in some patients with hepatic disease the test showed a pathological result after the administration of a large amount of protein by mouth. He states that the test is of value in the determination of operative risk, and that the results obtained before operation should be compared with those obtained in the post-operative period. He discusses the results of tests carried out after various operations with regard to their prognostic significance and to the administration of drugs which act specifically on the liver. He reports also his findings with regard to the behavior of the reaction as affected by various components of bile.

EDMUND T. LLOYD, M.D.

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NOTE—THE BOLD FACE FIGURES IN BRACKETS AT THE RIGHT OF A REFERENCE INDICATE THE PAGE OF THIS ISSUE ON WHICH AN ABSTRACT OF THE ARTICLE REFERRED TO MAY BE FOUND

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## SURGERY OF THE BLOOD AND LYMPH SYSTEMS

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acute leukaemia H. JACKSON, JR., Am. J. M. Sc., 1934,  
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APRIL, 1935

# International Abstract of Surgery

*Supplementary to*  
**Surgery, Gynecology and Obstetrics**

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## CONTENTS

I	Index of Abstracts of Current Literature	III-VI
II	Authors of Articles Abstracted	VIII
III	Abstracts of Current Literature	297-375
IV	Bibliography of Current Literature	376-400

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# CONTENTS—APRIL, 1935

## ABSTRACTS OF CURRENT LITERATURE

SURGERY OF THE HEAD AND NECK		CHURCHILL, E. D. The Operative Treatment of Hyperparathyroidism	374
Eye			
DORRANCE, G. M., and LOUDENSLAER, P. E.	Physiological Considerations in the Treatment of Pulsating Exophthalmos	297	
JAMESON, P. C.	The Use of Thyroxin in Ophthalmology Its Application as a Local Agent and Its Action as a Metabolic Alterative	298	
FRIEDENWALD, J. S.	Notes on the Allergy Theory of Sympathetic Ophthalmia	298	
THYGESON, P.	The Etiological Diagnosis of Conjunctivitis	298	
THYGESON, P.	The Etiology of Inclusion Blepharitis	299	
MACCALLAN, A. F.	Trachoma in the British Colonial Empire, Its Relation to Blindness, The Existing Means of Relief, Means and Prophylaxis	300	
HAGEDOORN, A.	Adenocarcinoma of a Meibomian Gland	301	
CASTROVIEJO, R.	Experimental Detachment of the Retina	301	
Ear			
TAYLOR, H. M.	Prenatal Medication as a Possible Etiological Factor of Deafness in the Newborn	301	
Nose and Sinuses			
WATSON-WILLIAMS, E.	Cancer of the Nasal Accessory Sinuses With Reports of Thirteen Cases	301	
Mouth			
DE CHOLNOKY, T.	Round Cell, Spindle Cell, and Neurogenic Sarcomata of the Lip	302	
FRIEDMAN, M., and RUBENFELD, S.	Malignant Neoplasms of the Upper Respiratory Tract in the Young	302	
Pharynx			
REUTER, F.	The Results of the Treatment of Malignant Tumors of the Ear, Nose, Pharynx, and Larynx in the Period from 1924 to 1932	302	
WOOD, G. B.	The Peritonsillar Spaces An Anatomical Study	303	
Neck			
GOETSCH, E.	The Correct and Incorrect Use of Iodine in the Treatment of Goiter	304	
BIRKETT, H. S.	Lipoma of the Larynx Intrinsic in Origin	304	
GARLAND, L. H.	Carcinoma of the Larynx	304	
SURGERY OF THE NERVOUS SYSTEM			
Brain and Its Coverings, Cranial Nerves			
ZORRAQUIN, G., POU, M. B., and URCAEAY, L.	Treatment of Asphyxia of the Cerebral Cell in Traumatic Accidents and Their Vascular Complications by Subcutaneous Injections of Carbon Dioxide	306	
VILLAREAL, F. V.	A New Technique for the Treatment of Traumatic Block of the Ventricles	306	
STIER, E.	The Importance of Investigation of the Equilibrium Apparatus for the Judgment of Old Head Injuries	307	
ROHDE, W.	Primary Melanotic Tumors of the Central Nervous System and Its Membranes	307	
PUECH, P., and STUHL, L.	Roentgen Study of Tumors of the Hypophysis and the Hypophyseal Region	307	
KORNBLUM, K., and OSKOND, L. H.	Deformation of the Sella Turcica by Tumors in the Pituitary Fossa	308	
BALADO, M., and PARDAL, R.	Surgical Treatment of Hypophyseal and Parahypophyseal Tumors	308	
ELSBERG, C. A., and DYKE, C. G.	Meningioma Attached to the Mesial Part of the Sphenoid Ridge with the Syndrome of Unilateral Optic Atrophy, a Defect in the Visual Field of the Same Eye and Changes in the Sella Turcica and in the Shape of the Interpeduncular Cistern After Encephalography	309	
DUEL, A. B.	Operative Treatment of Facial Palsy	310	
SHUMACKER, H. B., JR., and FIOR, W. M.	The Interrelationship of the Adrenal Cortex and the Anterior Lobe of the Hypophysis	375	
Spinal Cord and Its Coverings			
HAWORTH, E. M.	The Treatment of Syringomyelia by X-Rays	310	
Sympathetic Nerves			
DAVIS, A. A.	The Surgical Anatomy of the Presacral Nerve	311	
SURGERY OF THE CHEST			
Chest Wall and Breast			
TOD, M. C., and DAWSON, E. K.	The Diagnosis and Treatment of Doubtful Mammary Tumors		

## Trachea, Lung, and Pleura

KRAMER, H. The Influence of Different Degrees of Distention upon the Blood Flow Through the Lung

RINGER, P. H. Surgery in Pulmonary Tuberculosis Its Increasing Importance

BRUNT, H. Lung Abscess

HOWE, A. T. Malignant Disease of the Lung

FARRIS, P. L. Serial Bronchography in the Early Diagnosis of Bronchial Carcinoma

GEORGEKTER, C. F. and DENISON, R. Primary Carcinoma of the Lung

JACKSON, C. L. and KENZELMANN, F. W. Bronchial Carcinoma

TUTTLE, W. McC. and WOLFE, N. A. Bronchiogenic Carcinoma: A Classification as Relation to Treatment and Prognosis

RABY, C. B. and NEUBER, H. A Topographic Classification of Primary Cancer of the Lung: Its Application to the Operative Intervention and Treatment

EGGERS, C. Laboratory for Carcinoma of the Lung

OVERHOLT, R. H. The Total Removal of the Right Lung for Carcinoma

## Heart and Pericardium

HICKS, I. S. The Application of Kymoradiography to the Diagnosis of Cardiac Disease

STONER, P. K. Ray Fluorography of the Heart

## Esophagus and Mediastinum

OSWALD, A. and OSWALD, N. Ancestrous Esophagoplexy for Impermeable Stricture of the Esophagus

SCHULTZ, H. S. Cancer of the Esophagus

OFEN LOEWENT, L. and RAY, R. W. Surgical Exposure of the Esophagus

FORNAR, R. LEONARD, M. and PALLAS, J. E. Sarcomata of the Mediastinal Glands

## SURGERY OF THE ABDOMEN

## Abdominal Wall and Peritoneum

CATTERALL, A. The Balfour Operation and the Bruner Hackenbrech Drusey Schauden and Kirschner Operations

GOVILL, M. and SCHAEFER, F. Results of Further Clinical and Microbiological Studies of Peritonitis and Its Prevention and Treatment with Seron

M. M. M. An Anatomopathological and Clinical Contribution to the Study of Primary Tumors of the Mesentery

## Gastro-Intestinal Tract

RASHBERRY, C. The Optimal Treatment of Hypertrophic Stenosis of the Pylorus in Infants

BOYER, A. The Functional Displacement of the Intestine That Follows Abdominal Operations

WANDER, C. E. JR. and HART, D. Association of Intestinal Retention as Cause of Intestinal Obstruction: Report of Two Personal Observations and Review of Reported Cases

ELMAN, R. The Danger of Sudden Distention of the Acutely Distended Bowel in Late Low Intestinal Obstruction

HEAROCK, C. H. Calcification in Intestinal Tubercles

RANDY, F. W. and MARTIN, W. J. J. Diverticula of the Small Bowel

JOYCE, T. M. Tumors of the Small Intestine

STEVENS, M. E. and STARR, P. H. The Factor of Spasm in the Etiology of Peptic Ulcers

KAYTON, J. L. Anomalies of the Colon: Their Roentgen Diagnosis and Clinical Significance: A Review of 700 Years' Study

DALL, ALGER, V. and VALERIO, R. The Roentgen Appearance of the Mucosa of the Colon in Pathological Conditions

DAVIS, V. C. The Pathology and Treatment of Bleeding Polypoid Tumors of the Large Bowel

BOWER, W. H. A Study of the Etiology of Appendicitis

McKINNEY, V. Hematoma in Appendicitis

ORLE, J. F. and BOWLEY, J. P. The Management of Perforated Appendicitis

C. ALPERT, C. A. Abdominal Wall Defects Following Appendectomy

PERCIVAL, O. Sowa's Jump and Hyperplastic Intestinal Tuberculosis

TH. YERK, T. E. H. Simple Hemorrhagic Proctitis and Proctosigmoiditis

MILLAR, E. T. C. and MORGAN, C. N. The Surgical Anatomy of the Anal Canal

## Liver, Gall Bladder, Pancreas, and Spleen

LEV, A. C. and BRON, G. S. Applied Physiology of the Extrahepatic Biliary Tract

STEWART, W. H. and LILLY, H. E. Sources of Error in Oral Cholecystography with Suggested Methods of Correction

LARSEN, R. C. Chronic Congestive Splenomegaly and Its Relationship to Banti's Disease

## GYNECOLOGY

## Uterus

SEA, W. F. The Treatment of Genital Prolapse

W. JOSE, H. and HOFFMANN, H. The Radical Treatment of Benign Genital Hemorrhages

BOLAFFI, R. Prehypophyseal Hormones in Malignant Tumors of the Uterus, Considerations and Researches

SAMPSON, J. A. The Limitations and Dangers of the Intra-Uterine Application of Radium in the Treatment of Carcinoma of the Body of the Uterus

HEALY, W. P. and ANDERSON, A. M. Radiation Treatment of Carcinoma of the Cervix

## Adnexal and Peritoneal Conditions

NOVAK, E. and BRAUNER, J. M. Jr. Granulosa-Cell Tumors of the Ovary

External Genitalia

MENTER, D. Personal Technique for the Cure of Xanthomas in Women

## Miscellaneous

- TRAINA RAO, G Thermo Electrical Researches in Obstetrics and Gynecology 338
- WIESNER, B P The Postnatal Development of the Genital Organs in the Albino Rat 338
- BUTENANDT, A Recent Progress in the Study of Sex Hormones 339
- DONEDDU F P The Influence of Thymectomy on Genetic Activity and the Offspring 340

## OBSTETRICS

## Pregnancy and Its Complications

- DWY, L, and SEVINGHAUS, E L Analysis of Errors Inherent in Pregnancy Tests Based on the Aschheim Zondek Reaction 341
- ASTRINSKY and GRINER Gonorrhoea and Pregnancy 341
- STANDER, H J, and CADDEN, J F Blood Chemistry in Pre Eclampsia and Eclampsia 341
- EMGE, L A The Influence of Pregnancy on Tumor Growth 342

## Labor and Its Complications

- CALDWELL, W E., MOLOY, H C and DESOPO, D A A Roentgenological Study of the Mechanism of Engagement of the Fetal Head 343

## Puerperium and Its Complications

- SALVINI, A A Contribution to the Clinical Study and Therapy of Late Puerperal Hemorrhage 343
- WATSON, B P Practical Measures in the Prevention and Treatment of Puerperal Sepsis 343
- SERDUKOFF, G The Modern Management of Puerperal Fever 344
- SCHLINK, H H The Treatment of Surgical Injuries Following Childbirth 345

## Newborn

- TAYLOR, H M Prenatal Medication as a Possible Etiological Factor of Deafness in the Newborn 301

## GENITO-URINARY SURGERY

## Adrenal, Kidney, and Ureter

- RAGNOTTI, E Considerations and Researches on the Pathological and the Experimental Production of "Dynamic Hydronephrosis" 346
- JOLY, J S The Etiology of Stone 346
- PRATHER, G C A Method of Hemostasis During Nephrotomy for Large Kidney Calculi 346
- OFFENHEIMER, G D Polycystic Disease of the Kidney 346
- COLSTON, J A C Primary Tumor of the Ureter A New Method for Complete Nephro Ureterectomy 347
- LUCCHESI, G The Influence of the Suprarenals on the Formation of Bony Callus 349
- SHUMACKER, H B, JR, and FIOR, W M The Interrelationship of the Adrenal Cortex and the Anterior Lobe of the Hypophysis 375

## Bladder, Urethra, and Penis

- FRESNAIS, J Cutaneous Ureterostomy in the Treatment of Persistent Cystitis After Nephrectomy for Tuberculosis 347

## Genital Organs

- REAY, E R The Surgery of Prostatic Obstruction 348
- REGGIANT, M The Behavior of the Testicle Following Partial or Total Removal of the Parietal Portion of the Tunica Vaginalis 348

## SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

## Conditions of the Bones, Joints, Muscles, Tendons, Etc

- LUCCHESI, G The Influence of the Suprarenals on the Formation of Bony Callus 340
- ELLIS, R W B Osteopetrosis (Marble Bones, Albers Schoenberg Disease, Osteosclerosis Fragilis Generalisata Congenital Osteosclerosis) 349
- RICHARD, A, DUPUIS, P V, RÖDERER, C, and FROEY, R The Dyschondroplasia of Ollier 350
- MASSÉLOT, F, JAUBERT DE BEAUJEU, A, and BLOCH, E Progressive Myositis Ossificans 350
- BRISTOW, W R Acute and Chronic Sprains 351
- SMART, SIR M The Pathology and Treatment of Sprains 351
- BOSST, V Researches on the Method of Healing of Experimental Lesions of Tendons 352
- KECHT, B Subacute Suppurative Osteomyelitis of the Atlas 352
- SALISCHTS, L G Contribution to the Study of Congenital Radio-Ulnar Synostosis 352
- SCHAEER, H Patella Partita 353
- WILES, P Flat Feet 353
- SCAGLIETTI, O A Clinicostatistical Study of the Cases of Congenital Club Foot Observed at the Rizzoli Orthopedic Institute in the Period from 1899 to 1933 354
- LAMY, L The Congenital Convex Valgus Foot 354
- BROWNE, D Talipes Equinovarus 355
- SANTORO D'EMIDIO, A Radium Therapy in Bone Metastases from Breast Carcinoma 370

## Surgery of the Bones, Joints, Muscles, Tendons, Etc

- BONNET and DU BOUQUET Indications for Rachi-synthesis 356
- MASSART, R. Sacro-Iliac Surgery 356
- BRISTOW, W R Results of Operations on Painful Hips 356
- HLET and DE FOURMESTRAUX The Treatment of Suppurative Arthritis of the Knee Exclusive of War Injuries 357
- Fractures and Dislocations
- HOUDARD, L, and JUDET, J The Value of Modern Methods of Osteosynthesis by External Fixation in the Cases of Adults 357
- FÉVRE, M and DUPUIS, P The Treatment of Irreducible Congenital Dislocation of the Patella 357

# INTERNATIONAL ABSTRACT OF SURGERY

## SURGERY OF BLOOD AND LYMPH SYSTEMS

**Blood Vessels**

CUTCHILL, E. Migrating Intra-arterial Projections 359

COTTELL, V., and N. ULLIAT, J. Results of Arteriography in Diseases of the Arteries and Tumors 360

KOCHING, N. Problems of Etiology, Clinical Findings, and Treatment in Endarteritis Obliterans 36

HEDMARK, L. G. and RIM, M. R. Passive Vaso-lytic Enzymes: The Treatment of Peripheral Obstructive Arterial Diseases by Rhythmic Alteration of Environmental Pressure 36

MONTESANTO, O. An Experimental Contribution to the Surgery of the Inferior Vena Cava 36

HOSAKA, J. Thrombosis of the Deep Veins of the Lower Leg Causing Pulmonary Embolism 36

**Blood Transfusion**

JONES, H. W., and TOCANTI, L. M. The Treatment of Hemophilia 365

## SURGICAL TECHNIQUE

**Operative Surgery and Technique Postoperative Treatment**

LEIBOW, E. L. and McLAUGHLIN, C. Postoperative Wound Complications 364

MAER, U. BOYCE, F. F. and McSTEVEN, E. M. Postoperative Emaciation 364

**Anesthesia**

CARROLL, A. Clinical Observations on the General Reactions of the Body to Ether Inhalation Anesthesia 365

KILLIAN, H. The New General Anesthetic Sodium Amytal 365

MYRSTAD, G. and STENSTRA, L. A Critical Study of General Anesthesia Induced with Fipos Sodium 365

LYNCH, F. M. ELY, S. and LIEBER, H. Evaporated Sodium A Short Intracranial Anesthetic 366

C. T. F. W. Further Studies in Subarachnoid Anesthesia 367

**Miscellaneous**

LOE. The Principles, Application, and Results of Short Wave Diathermy 36

BRYCE, L. LAUDAT, M., and AUSTIN, J. Hyperthermia Caused by Short Waves 37

SANTORO, M. TARDIO, A. Radium Therapy in Bone Metastases from Breast Carcinoma 37

## MISCELLANEOUS

**PHYSICO-CHEMICAL METHODS IN SURGERY**

**Radiology**

PERL, P. and STIEL, I. Roentgen Study of Tumors of the Hypopharynx and the Hypopharyngeal Region 367

HAUT, F. M. The Treatment of Syngonocystis by X Rays 370

F. P. L. Serial Bronchography in the Early Diagnosis of Bronchial Carcinoma 370

KATSON, J. L. Anomalies of the Colon: Their Roentgen Diagnosis and Clinical Significance A Review of Ten Years Study 377

DALL, A. C. and V. LECHE, R. The Roentgen Appearance of the Mucosa of the Colon in Pathological Conditions 377

PERL, G. Sterile Jump and Hyperplastic Intestinal Tuberculosis 378

STIER, W. H. and LILLY, H. E. Sources of Error in Oral Cholangiography with Suggested Methods of Correction 380

STANDER, H. J. and CAMBER, J. F. Blood Chemistry in Pre-Eclampsia and Eclampsia 347

CALDWELL, W. E., MOLT, H. C., and D. EAGLE, D. A. A Roentgenological Study of the Mechanism of Engagement of the Fetal Head 348

COTTELL, V. and N. ULLIAT, J. Results of Arteriography in Diseases of the Arteries and Tumors 349

QUERRY, E. H. CORRELL, M. M. and WOODS, R. C. The Distribution of Roentgen Rays Within the Human Body 349

HICKS, I. S. The Application of Kymocentography to the Diagnosis of Cardiac Disease 348

STURM, P. X-Ray Kymography of the Heart 348

WITTE, H. and WITTENBERG, F. J. The Reasons for Failures in Roentgen Therapy of Carcinoma 349

**Radicals**

NAUDOL, H. and HOWTH, A. H. The Radium Treatment of Benign Cervical Hemorrhages 351

BARROW, J. A. The Indications and Dangers of the Intra-Uterine Application of Radium in the Treatment of Carcinoma of the Body of the Uterus 356

HEAT, W. P. and LANTIER, A. N. Radiation Treatment of Carcinoma of the Cervix 357

SANTORO, M. TARDIO, A. Radium Therapy in Bone Metastases from Breast Carcinoma 37

**Clinical Entities—General Physiological Conditions**

BLALOCK, A. The Influence of Exposure to Cold and of Deprivation of Food and Water on the Development of Shock 372

MURKELL, A. O. and BROWN, E. W. The Clinical Implications of the Thyroid and Stated Thyroid Complications 372

FELTHER, R. C. Palmar Cysts and Fistulae 37

MAROLA, G. The Surgical Complications of Duodenal Lesions 373

**General Bacterial, Protozoan, and Parasitic Infections**

SEELER, A. E., SPENCER, M. J., and MACNEAL, W. J. The Therapeutic Use of Concentrated Autosterilized Serum of the New York State Department of Health 373

**Ductless Glands**

CUTCHILL, E. D. The Operative Treatment of Hyperparathyroidism 374

ROWE, L. G. CLA, C. J. H. and H. WOOD, A. M. The Biological Effects of Thyroid Extract (HARSON) 374

SCHEWACKER, H. B. J. and FISON, W. M. The Interrelationship of the Adrenal Cortex and the Anterior Lobe of the Hypophysis 371

## BIBLIOGRAPHY

## Surgery of the Head and Neck

Head  
Eye  
Ear  
Nose and Sinuses  
Mouth  
Pharynx  
Neck

376  
376  
377  
377  
378  
378  
378

## Surgery of the Nervous System

Brain and Its Coverings, Cranial Nerves  
Spinal Cord and Its Coverings  
Peripheral Nerves  
Sympathetic Nerves  
Miscellaneous

379  
379  
379  
380  
380

## Surgery of the Chest

Chest Wall and Breast  
Trachea, Lungs, and Pleura  
Heart and Pericardium  
Esophagus and Mediastinum  
Miscellaneous

380  
380  
381  
381  
381

## Surgery of the Abdomen

Abdominal Wall and Peritoneum  
Gastro-Intestinal Tract  
Liver, Gall Bladder, Pancreas, and Spleen  
Miscellaneous

382  
382  
384  
385

## Gynecology

Uterus  
Adnexal and Peritoneal Conditions  
External Genitalia  
Miscellaneous

385  
386  
387  
387

## Obstetrics

Pregnancy and Its Complications  
Labor and Its Complications  
Puerperium and Its Complications  
Newborn  
Miscellaneous

388  
389  
390  
390  
391

## Genito-Urinary Surgery

Adrenal, Kidney, and Ureter  
Bladder, Urethra, and Penis  
Genital Organs  
Miscellaneous

391  
391  
392  
392

## Surgery of the Bones, Joints, Muscles, Tendons

Conditions of the Bones, Joints, Muscles, Tendons,  
Etc

392

Surgery of the Bones, Joints, Muscles, Tendons, Etc  
Fractures and Dislocations

394  
394

## Surgery of the Blood and Lymph Systems

Blood Vessels  
Blood, Transfusion  
Lymph Glands and Lymphatic Vessels

395  
396  
396

## Surgical Technique

Operative Surgery and Technique, Postoperative  
Treatment

396

Antiseptic Surgery, Treatment of Wounds and Infections

397

Anæsthesia

397

Surgical Instruments and Apparatus

398

## Physicochemical Methods in Surgery

Roentgenology  
Radium  
Miscellaneous

398  
398  
398

## Miscellaneous

Clinical Entities—General Physiological Conditions  
General Bacterial, Protozoan, and Parasitic Infections  
Ductless Glands

399  
400  
400



## AUTHORS OF ARTICLES ABSTRACTED

- Aramson, A. N. 336  
 Astrachy, S. 34  
 Auldair, J. 37  
 Balado, M. 308  
 Bergh, G. S. 32  
 Binet, L. 37  
 Berlet, H. E. 304  
 Black, A. 373  
 Bloch, E. 350  
 Block, R. 336  
 Bonnet, C. 350  
 Bonney, V. 333  
 Bown, V. 31  
 Bowen, W. H. 330  
 Bowler, J. P. 330  
 Boyce, F. F. 304  
 Brainerd, J. N. J. 333  
 Brinow, W. R. 33 336  
 Brown, E. W. 373  
 Browne, D. 355  
 Bruas, H. 34  
 Butenandt, A. 330  
 Cadden, J. F. 343  
 Caldwell, W. E. 343  
 Cardas, A. 305  
 Carver, G. A. 330  
 Castroviejo, R. 30  
 Catherine, A. 32  
 Churchhill, E. D. 374  
 Clark, J. H. 374  
 Clesius, J. A. C. 347  
 Coatsides, A. 306  
 Copeland, M. M. 308  
 CoTru, T. W. 307  
 Corbitt, E. 350  
 Dall'Aquila, V. 348  
 De la, J. C. 348  
 De la, A. J. 3  
 Davy, L. 34  
 Dawson, E. M. 34  
 De Chobovsky, T. 30  
 De Fournestran, S. 35  
 Deussen, R. 35  
 D'Esopo, D. A. 343  
 Deschamps, F. P. 340  
 Dorrance, G. M. 307  
 Du Bouquet, J. 306  
 Doud, A. B. 3  
 Dupont, P. 357  
 Dupont, P. V. 350  
 Dyke, C. G. 300  
 Edwards, A. F. 353
- Eggers, C. 317  
 Elmore, E. L. 304  
 Ellis, R. W. B. 340  
 Elman, R. 336  
 Elberg, C. A. 300  
 Engel, L. A. 343  
 Eny, S. 306  
 Farida, F. L. 353  
 Ferraro, R. C. 373  
 Fibre, M. 357  
 Furo, W. M. 373  
 Forman, J. 347  
 Friedewald, J. S. 308  
 Friedman, M. 303  
 Fryer, R. 350  
 Gaudier, C. E. J. 345  
 Gaudier, L. H. 304  
 Gendekow, C. I. 353  
 Gale, J. F. 336  
 Gault, E. 304  
 Giesler, J. 34  
 Gindel, M. 3  
 Hagenaars, A. 304  
 Haggens, A. M. 374  
 Hart, D. 353  
 Haworth, E. M. 3  
 Henscock, C. H. 306  
 Healy, W. P. 336  
 Herrmann, L. G. 35  
 Hirsch, I. B. 308  
 Hoffmann, H. 333  
 Homan, J. 304  
 Houtard, L. 357  
 Host, J. 377  
 Hück, H. E. 333  
 Ivy, A. C. 33  
 Jackson, C. L. 306  
 Jackson, F. C. 308  
 Jarrett de Beauregard, A. 350  
 Joly, J. S. 340  
 Jones, H. H. 303  
 Joyce, T. M. 308  
 Julet, J. 337  
 Kantor, J. L. 307  
 Keck, E. 35  
 Kilham, H. 305  
 Koenigsmann, F. W. 306  
 Koonen, A. 303  
 Koonen, A. 30  
 Koonen, H. 35  
 Lamy, J. 354  
 Larrabee, K. C. 333
- Landst, M. 371  
 Legend, M. 3  
 Lewis, H. 306  
 Livingston, L. M. 306  
 Leby, S. 378  
 Leontievsky, P. E. 307  
 Leuchner, U. 340  
 MacCallan, A. F. 300  
 MacNeal, W. J. 373  
 Macra, U. 304  
 Martin, W. J. Jr. 336  
 Massart, R. 336  
 Massicot, F. 350  
 Mathey, G. 373  
 Masson, M. 373  
 McFetridge, L. M. 304  
 Mackinac, W. 330  
 McLoughlin, C. 304  
 Manegault, G. 306  
 Mercer, O. 337  
 Michigan, J. C. 330  
 Mitchell, A. G. 37  
 Moley, H. C. 345  
 Molesworth, U. 303  
 Moynihan, C. N. 330  
 N. J. 335  
 Nalanda, J. 306  
 Neufeld, H. 336  
 Nevsk, E. 337  
 Ochsner, A. 338  
 Oppenheimer, G. D. 340  
 Oshaghtony, L. 330  
 Osmund, L. H. 305  
 Overholt, R. H. 308  
 Owens, N. 308  
 Paffes, J. L. 3  
 Pandal, K. 308  
 Parnes, G. 330  
 Parnes, M. 3  
 Pasi, M. B. 306  
 Prather, G. C. 340  
 Puerch, P. 307  
 Quenby, B. H. 308  
 Rabin, C. H. 308  
 Ragnotti, E. 306  
 Rasmussen, C. 324  
 Rasmussen, I. W. 306  
 Raven, R. W. 330  
 May E. R. 348  
 Reggiani, M. 347  
 Reid, M. R. 30
- Reuter, F. 300  
 Richard, A. 350  
 Ring, P. H. 34  
 Rindert, C. 350  
 Rindert, W. 307  
 Rowntree, L. G. 374  
 Rubinfeld, S. 300  
 Salomons, L. G. 35  
 Salzman, A. 343  
 Samson, J. A. 336  
 Santos d'Amato, A. 370  
 Scaghiotti, O. 334  
 Scherer, H. 333  
 Schick, H. H. 345  
 Schick, H. H. 345  
 Seidman, G. 344  
 Sevinthoff, E. L. 34  
 Shaw, W. F. 333  
 Shepley, A. K. 373  
 Shomacher, H. B. J. 373  
 Smart, S. M. 357  
 Smetter, H. S. 310  
 Spencer, M. J. 373  
 Stander, H. J. 34  
 Starr, P. H. 337  
 Steinberg, M. E. 337  
 Stewart, W. H. 333  
 Stier, E. 307  
 Stahl, L. 307  
 Stump, P. 308  
 Stump, P. 308  
 T. J. 333  
 Taylor, H. M. 30  
 Thayer, T. B. H. 330  
 Thayer, T. B. H. 330  
 Toccione, L. M. 303  
 Tod, M. C. 3  
 Trause, R. M. 354  
 Ullrich, W. McC. 316  
 Uroary, L. 306  
 Valocchi, K. 334  
 Villanar, J. V. 306  
 Watson, B. P. 347  
 Watson, B. P. 307  
 Warner, B. P. 334  
 Widen, P. 333  
 Winton, H. 306  
 Wintstock, I. 306  
 Wintstock, N. A. 306  
 Wood, G. B. 307  
 Woods, R. C. 308  
 Zernicke, G. 308

# INTERNATIONAL ABSTRACT OF SURGERY

APRIL, 1935

## ABSTRACTS OF CURRENT LITERATURE SURGERY OF THE HEAD AND NECK

### EYE

Dorrance, G. M., and Loudenslager, P. E. Physiological Considerations in the Treatment of Pulsating Exophthalmos. *Am J Ophth*, 1934, 17: 1099

From ten cases of pulsating exophthalmos in which studies were made of the retrograde flow from the anastomoses of the external carotid artery down the external carotid, past the bifurcation, and into the internal carotid, the authors draw the following conclusions:

- 1 Following ligation of the common carotid artery the internal becomes a branch of the external and the volume flow in the internal is reduced about 50 per cent

- 2 Almost one half of the recurrent flow in the external carotid artery comes through the superior thyroid artery

The authors believe that as a general rule it is wise to ligate the common carotid artery alone. This frequently results in cure. If the symptoms persist or recur, the superior thyroid and occipital arteries should be ligated. Later the external trunk may require ligation. Successful results are more frequent if the following physiological facts are borne in mind:

- 1 When the blood volume in the internal carotid artery is reduced slowly there is less likelihood of starting a back-flow from the artery distal to the fistula

- 2 Any volume of blood which is reaching the brain by this route is proportionately preserved

- 3 The existence in the bifurcation of the common carotid of a carotid sinus that regulates the circulation to the brain may be so influenced that the heart may be slowed and the blood pressure reduced, any abnormality of the cerebral blood supply being thereby accentuated. Removal of the stimulation to this sinus will result in an increase in the heart rate and blood pressure

Ligation of the internal carotid artery in the presence of an arteriovenous fistula in the cavernous

sinus is contra indicated because it is frequently followed by hemiplegia. It completely cuts off any blood which may be getting past the fistula and into the brain. It creates an area of low resistance at the site of the fistula, and may result in the draining of large quantities of blood from the cerebral channels with consequent cerebral complications. It creates an increased pressure within the carotid sinus, thereby lowering the blood pressure and the pulse rate.

Ligation of the common carotid artery is relatively seldom followed by complications such as hemiplegia. It reduces the blood flow in the internal carotid artery, aids collateral circulation in the brain, permits fractional ligation of the internal carotid, thereby reducing the flow through the fistula between the internal carotid artery and the cavernous sinus without stimulating a reverse flow from the distal segment, and reduces the pressure within the carotid sinus, thereby increasing the blood pressure and heart rate and preventing slowing of the circulation in the cerebral areas.

From a study of all phases the authors draw the following conclusions:

- 1 Routine pre operative compression of the carotid vessels and the use of fascial bands or rigid clamps such as those of Matas or Neff may contribute to the incidence of postoperative complications

- 2 Simultaneous ligation of the internal jugular vein is more apt to be detrimental than helpful

- 3 In the presence of mouth, nose, or throat infection, the operative wound in the neck should be drained

- 4 Anomalies of the circle of Willis are so rarely uncompensated that deficiency of collateral circulation because of them cannot explain all of the cerebral complications which follow ligation of the carotid vessels

- 5 Cerebral accidents following these ligations are due largely to sudden extreme reduction in the blood pressure resulting in stagnation of the blood stream in cerebral areas. LESLIE L. MCCOY, M.D.

## INTERNATIONAL ABSTRACT OF SURGERY

Jamerson, P. C. The Use of Thyroxin in Ophthalmology Its Application As a Local Agent and Its Action As Metabolic Alternative. *Arch Ophth* 934. 635.

The use of thyroxin in the eye was first tried by Browning in his own eye in an attempt to arrest failure of vision associated with exophthalmos and pressure. Jamerson reviews briefly the biological and biochemical investigations and claims that a definite alternative to eliminative action follows the topical action of thyroxin in the eye. He gives detailed instructions for the preparation of a natural crystalline thyroxin. The solution has been used in strengths varying from 1 to 5 mgrm. to 1 ccm. of water. A synthetic product containing 5 mgrm per cubic centimeter is on the market. This may be labelled undiluted. The small amount used is not likely to cause a general toxic effect.

Thyroxin has been a general toxic effect. Five patients have been administered about seventy cases the effect has been striking. While it is doubtful whether thyroxin will influence all developed nuclear changes, it may prove valuable in retarding incipient opacifications and in lessening tension incident to tamponades of the lens. It does not contract the pupil. It has caused noticeable improvement in cases of floating vitreous opacities and stinging improvement in large proportions of keratitic conditions.

In his own case Browning noted definite improvement of near vision from ability to read only 14th lines. He became able to discontinue the use of bifocals of present.

Other conditions for which thyroxin has been employed include kerato-conjunctivitis, keratitis, corneal opacity, linitis following the removal of a cataract, and a postoperative injury with considerable reaction and much vitreous debris. In all of the cases marked improvement in vision as obtained.

With regard to the use of thyroxin as obtained cataracts, Jamerson says that such cataracts have never shown regression and the slight improvement noted cannot be properly judged as yet. Tension is definitely reduced without contraction of the pupil, but further investigation must be made before definite conclusions can be reached.

The tenderness toward inflammatory reaction which is sometimes revealed by pressure over the ciliary body and muscles and is probably of rheumatic origin is relieved by thyroxin. Vitreous opacities have been markedly improved. Basal metabolism tests may yield information as to dosage and the reason for the effect of thyroxin accounts for its penetrative property but iodine alone is not responsible for the improvement obtained as potassium iodide and glycine, which has been used for many years, does not have the same effect. Neither is sodium hydroxide the active agent, as solutions of the same strength as those used in

the thyroxin preparation do not reduce the tension as does thyroxin solution.

The symptoms of exophthalmos are a feeling of suffocation or pull in the eye, labialness of the or blemish, widening of the palpebral fissure, and mild transient paresthesias. EDWARD S. PLATT, M.D.

Friedenwald, J. A. Notes on the Altery Theory of Sympathetic Ophthalmia. *Am J Ophth* 1934. 7 ood.

The histological appearance of sympathetic ophthalmia is well known and is compatible with the theory that the condition is due to allergy. The reaction in cases of sympathetic ophthalmia to the intradermal injections of avian pigment has all of the characteristics of the inflammatory reaction to the eye. False positive reactions having been regarded to avian pigment is responsible for the lesions of sympathetic ophthalmia, some other factor is required to release the avian pigment from the melanophores and make it available for the reaction. The additional factor necessary for induction of the intra-ocular melanophores is a protein antigen as attempts to desensitize and to block and ineffective. The body should therefore be supplied with this pigment at some other point. An melanin of the skin is probably related to the melanin of the uveal tract. Proliferation of the distributed source of pigment, proliferation of the treated three cases of sympathetic ophthalmia, ultraviolet light with interesting results.

Thygeson, P. Etiological Diagnosis of Conjunctivitis. *Arch Ophth* 934. 674.

The conjunctiva has a limited normal bacterial flora, the only constant organisms being the corynebacterium, streptococcus and the staphylococcus albus. Both of these are saprophytes. In the presence of either the invader is so that an almost pure culture of the latter is obtainable. Thygeson presents techniques for quick determination of the cause of an infection by use of the Gram and Gause stains, culture technique for further identification of the causative agents and charts for differentiation of the organisms. He states that bacteriophage culture and assay are to infection in the conjunctiva is second only to removal of the lacrimal sac. The procedure is necessary. The most common causes of the infection are the diplococcus pneumoniae, hemophilus influenzae, and staphylococcus hemolyticus.

In viral catarrh the constant finding of eosinophilic cells in the secretion is of diagnostic importance. Scrapings from the upper tarsal conjunctiva are of most value.

Under the term "inclusion conjunctivitis," Thygeson groups the 2 non bacterial conjunctival diseases, inclusion blenorrrhea and swimming pool conjunctivitis, which are caused by a single virus. He suggests substituting the name "adult inclusion conjunctivitis" for the name "swimming pool conjunctivitis" as the swimming pool no longer plays a major part in the spread of the disease. The majority of cases now seen are the result of direct transfer from inclusion diseases of the genito-urinary tract.

It is the inclusion conjunctivitis occurring in adults which is most often confused with trachoma. The examination of expressed follicular contents after Giemsa staining is of diagnostic aid. In trachoma the large mononuclear cells predominate, while in all forms of follicular conjunctivitis the small mononuclear cells are the most numerous. In the trachoma follicle the central portion may be expressed easily, whereas in follicular conjunctivitis the follicles are hard and must be torn out *in toto*.

Actively secreting, so called acute trachoma is of the following 3 types: (1) chronic trachoma plus superimposed infections, in which inclusions and free bodies are rare, (2) subacute trachoma plus superimposed infection, in which inclusions and free bodies are more numerous, and (3) subacute trachoma unassociated with pathogenic bacteria, in which inclusions and free bodies are numerous. A search for free bodies in chronic trachoma is not recommended as the diagnosis is aided by pre dominance of large mononuclear cells. The characteristics of inclusion bodies are discussed.

In a series of 314 cases the etiological agent was identified in 91 per cent of the acute cases of conjunctivitis, 85 per cent of the subacute cases, and 46 per cent of the chronic cases.

In acute conjunctivitis the diagnosis should always be made by the examination of a smear. In the treatment of gonorrhoeal ophthalmia and conjunctivitis due to the Koch Weeks or influenza bacillus the author has found a 0.5 per cent silver nitrate ointment superior to the solution. For conjunctivitis due to the pneumococcus the application of a 1 per cent optochin is advised. Diphtheria antitoxin and anti streptococcus antitoxin, used locally and parenterally, are specific for these types of infection.

Four definite types of chronic conjunctivitis are recognized: (1) infection by the diplobacillus of Morax, (2) infection by the staphylococcus pyogenes aureus, (3) conjunctivitis in which eosinophilic cells predominate, and (4) conjunctivitis in which the findings are negative. The first type responds to treatment with zinc sulphate ointment. The use of this ointment should be continued for a month after relief of the symptoms. In the second type of chronic conjunctivitis, treatment may be difficult. For this type the use of silver nitrate ointment and vaccine is suggested. The third type is an indication of vernal catarrh or simple conjunctival allergy. In the fourth type no

laboratory help is available. A slit-lamp examination should be made for superficial punctate keratitis.

In cases of trachoma it is important to determine whether the symptoms are due to secondary infection or to the virus. When they are due to secondary infection, silver nitrate is indicated, whereas when they are due to the virus, copper sulphate should be used.

Some of the follicular cases, such as those due to phlyctenulosis and atropin, bacterial toxins, or infections of unknown origin, are toxic. In children, follicular conjunctivitis is often caused by the diplococcus of Morax, and in susceptible persons it has been known to result from chronic infection by the staphylococcus pyogenes aureus.

In an occasional case of conjunctival folliculosis with secondary infection relief is obtained without disappearance of the follicular hypertrophy. Another type of case presents a granular appearance of the lower lid with blepharitis which simulates folliculosis, but is in reality a papillary hypertrophy, the result of a low grade bacterial infection. It is usually due to the diplococcus of Morax and responds to treatment with zinc.

In the discussion of this report, VERHOEFF called attention to tuberculous, phlyctenular, Parinaud, and herpetic conjunctivitis, squirrel plague, ophthalmia nodosa, conjunctivitis due to insect bites, pemphigus, and rosacea conjunctivitis. He stated that the last-named is the most common form of chronic conjunctivitis. The diagnosis of swimming-pool conjunctivitis may be aided by the presence of enlargement of the preauricular glands. Lachrymal conjunctivitis may be caused by streptothrix concretions in the canaliculi. Diphtheritic conjunctivitis may be produced by the cornebacterium ulcerans, under which circumstances the antitoxin is useless. In pneumococcal infection such good results are obtained with boric acid and zinc sulphate that the use of optochin is of questionable value.

EDWARD S. PLATT, M.D.

Thygeson, P. The Etiology of Inclusion Blenorrrhea. *Am J Ophth*, 1934, 17, 1019.

Many ophthalmologists have noted the presence of inclusion bodies in various types of conjunctivitis. These bodies may or may not be associated with bacteria. Of seventy-seven cases of conjunctivitis in the newborn which Thygeson studied, eleven were bacteriologically negative. Ordinary laboratory animals could not be infected with material from the eyes of the infants. Monkeys proved difficult to infect. Baboons were less resistant.

The author concludes that inclusion blenorrrhea is a distinct clinical entity. It appears from five to nine days after birth and persists for from three months to a year. It is resistant to treatment. All cases of inclusion blenorrrhea and most cases of swimming-pool conjunctivitis are due to a virus disease of the genito-urinary tract. Both conditions are distinct from trachoma. VIRGIL WESCOTT, M.D.

MacCallan, A. F.: Trachoma in the British Colonial Empire; Its Relation to Blindness; The Existing Means of Relief; Means and Prophylaxis. *Br J Ophth* 1934, 8: 6-5.

MacCallan discusses the incidence of trachoma and acute conjunctivitis in various parts of the British Empire.

In Canada there are few unimportant foci of these conditions among Hebrew and Eastern European immigrants. Among the Indians, who have increased by 10 per cent in the last ten years, the incidence of trachoma and acute conjunctivitis is about 0 per cent. Medical officers examining immigrants are given instructions for the recognition of trachoma. At the Indian residential schools a definite treatment procedure is followed when the services of an eye specialist are not available. This includes the use of an antiseptic eye-lotion tablet, copper-citrate ointment tube, individual eye droppers, and lysol solution.

In Australia the disease is regarded rather lightly, but shows definite limitation to the outskirts of established settlements. In the civilized communities its incidence is lower. In areas in which it occurs school children are examined frequently and efforts are made to educate the public with regard to it. In New Zealand and South Africa, cases of trachoma are not very common.

In the Indian Empire trachoma is very widespread. It is reported to be universal in many of the provinces. The most important effort to combat it has been the controlled enlistment of trachomatous recruits in the Indian Army. Investigations made in the cases of such recruits show that the disease is widespread among certain classes, particularly the Sikhs, of whom all over 90 per cent are infected. The infection starts in childhood, and in the majority of cases ultimately reaches a quiescent stage which causes little disability. In the past large numbers of trachomatous men have been enlisted and have served as efficient soldiers. No evidence has been found to show that the disease is so infectious as to render the enlistment of these men a danger to their fellows or to the British troops serving with them. Of 65 trachomatous recruits enlisted during the past year 65 were discharged as incurable. In many of the schools every boy below the age of twelve years was found infected. On the other hand, of 1,500 boys in school at Simla, on the heights of the lower Himalayas, only 3 per cent were infected. With overcrowding and unsanitary conditions among the poorer classes conditions are ideal for the spread of trachoma because of irritation from flies, smoke and dust. In its earliest stage the disease is largely neglected, and in its more advanced stages treatment is often discontinued by the patient when comparative relief has been obtained. Because of the huge expenditure of money which is necessary to combat cholera, plague, and malaria, it is impossible to devote the required funds to improve the ocular condition of the people.

In Malta the disease was practically universal among the poorer classes at one time, but as the result of the treatment given during the last ten years by government dispensaries and district nurses, ophthalmic conditions have been greatly improved. In 1933, only 553 cases of trachoma were reported.

In the Asiatic colonies trachoma is very common, but its exact incidence is uncertain. Treatment is provided wherever possible by traveling motor dispensaries and by clinics. In Palestine the percent of blind persons among the population is greater than in any other country in the world. The estimated number of blind persons per 100,000 population in various countries is as follows: Palestine, 843 (blind in 1914, 568); Egypt, 776; Latvia, 776; Turkey, 97; British India, 50; Italy, 11; England, 75; France, 71; Germany, 50; and Holland, 36. From a review of the various causes of blindness in Palestine the conclusion is reached that these cases include trachoma complicated by infection but not uncomplicated trachoma of the first stage.

In the Empire Crown colonies and Protectorates the incidence of trachoma varies.

In 8,713 cases of gonorrhea treated in Tanganyika there were no cases of gonorrheal ophthalmia.

In the American Imperial Crown Colonies no record of trachoma as found in the government health reports. In British Guiana no trachoma is reported, but hypopyon after keratomalacia is frequent because of deficiencies in the diet. Also frequent are night blindness and severe xerophthalmia.

Trachoma is prevalent in the Fiji Islands and occurs also in the Pacific Islands group.

The survey indicates that in the absence of fulminating epidemics of cat conjunctivitis added to trachoma the population may be generally infected with trachoma without any important demand for treatment or prophylaxis. While the scheme for prophylaxis must be adapted to local conditions, a method which can be applied in all countries is treatment of the children in the schools and of their parents and relatives in hospitals and clinics.

Trachoma shows 4 stages. The first stage, which is characterized by tiny pushead follicles, and the second stage which is characterized by gelatinous follicles or papillary development, are the infectious stages. The third stage, in which contraction begins, is much less infective, and the fourth stage, that of contracted trachoma, is not infective. Uncomplicated cases deterioration of visual acuity may result from induration of the cornea manifested by pannus or by traction produced by trichiasis causing corneal ulceration.

Cure of trachoma results from the laying down of cicatricial tissue in place of the trachomatous granulation tissue. This may occur spontaneously or as the result of the daily application of caustics over a long period of time. Our means of inducing the formation of cicatricial tissue are no better today than thirty years ago.

FRANK S. PLATT, M.D.

Hagedoorn, A. Adenocarcinoma of a Meibomian Gland. *Arch Ophthalmol*, 1934, 12: 550

Tumors of the meibomian glands are either adenoma or carcinoma. The tumor described by the author was formed in its more quiet areas of bands of sebaceous mother cells arranged on a basal membrane, above which there was a successive metamorphosis into sebaceous cells. This is the picture that may be expected in adenoma. However, most parts of the tumor showed a marked irregularity of arrangement and the presence of other types of cells closely related to pavement epithelium (prickle cells, keratohyalin containing cells, and a few horn producing cells). The Sudan III test showed fatty substances and the polarized light test revealed cholesterol in large amounts. Metastasis developed in the parotid region and the supraclavicular glands, and the patient died from the effects of the tumor.

The frequency and malignancy of such tumors are difficult to estimate as the diagnosis may be easily missed. Only about sixty growths of this type have been described. The author warns against the impression gained from the literature that tumors of the meibomian glands are generally adenomata and therefore benign. He states that, according to the evidence, one half of them tend to become malignant.

In conclusion Hagedoorn says that in cases of tumor of the parotid or supraclavicular region the general surgeon and pathologist should bear in mind that the eyelid may be or may have been the site of the original tumor. When suspicion arises staining of a frozen section with Sudan III is of considerable aid in the diagnosis.

LESLIE I. MCCOY, M.D.

Castroviejo, R. Experimental Detachment of the Retina. *Am J Ophthalmol*, 1934, 17: 1112

The author reports a satisfactory method for the production of permanent retinal detachment in the eyes of rabbits. The detachment has all the clinical characteristics of idiopathic retinal detachment in human beings and even after as long as four months no cure has been observed. An incision is made in the conjunctiva along the equator, the rectus muscle is severed, and an incision of 2 mm. is made through the sclera, choroid and retina into the vitreous. From 0.5 to 0.6 c.c. of vitreous is then removed by suction by means of a blunt hypodermic needle, the retina is separated from the choroid with a spatula, and the vitreous is re-injected between the sclera and choroid. WILLIAM A. MANN, JR., M.D.

## EAR

Taylor, H. M. Prenatal Medication as a Possible Etiological Factor of Deafness in the Newborn. *Arch Otolaryngol*, 1934, 20: 790

The author is of the opinion that certain drugs have an affinity for the auditory nerve, and that idiosyncrasy for drugs may be an important factor

in nerve deafness. Chief among the drugs causing nerve deafness is quinine, which is frequently used during pregnancy. There is evidence that when certain drugs acting upon the auditory nerve are administered to the pregnant woman they pass readily through the placenta and may be toxic to the fetus, a possibility which the otologist has virtually ignored.

Prenatal medication as a possible etiological factor of deafness in the newborn is of sufficient importance to warrant cooperative research by the biochemist, histopathologist, obstetrician, and otologist.

JAMES C. BRASWELL, M.D.

## NOSE AND SINUSES

Watson-Williams, F. Cancer of the Nasal Accessory Sinuses With Reports of Thirteen Cases. *Practitioner*, 1934, 133: 717

Malignant disease of the nasal sinuses is not very common. It occurs most frequently in elderly persons. Although a diagnosis is generally possible before dissemination has taken place, the results of treatment are usually poor.

The author reviews thirteen cases. Three of his patients showed evidence of chronic sinusitis. One of the patients with chronic sinusitis and two others ascribed the onset of the condition to influenza. Although neither sinusitis nor influenza is rare, such histories may indicate that these conditions are of some etiological significance. It has been stated that malignant change in a "mucous" polypus is not infrequent.

The symptoms of cancer of the nasal accessory sinuses are determined by the situation rather than the histological character of the growth. When the ethmoid is involved the patient complains usually of nasal obstruction and discharge. The ethmoid was involved in six of the cases reported. When only the antrum is affected, pain, swelling, or stiffness of the cheek is the initial symptom and nasal symptoms may be absent. When only the ethmoid is involved, the cheek is normal. Of the author's four cases in which both the ethmoid and the antrum were involved, the cheek was swollen in two and the palate in one. In either localization of the disease, epiphora, proptosis, or diplopia may occur. Glandular swelling is somewhat unusual in the early stages. Roentgenographic examination yields a characteristic picture in half of the cases and useful information in all. Biopsy should be deferred until treatment is arranged.

The author describes the technique of radium treatment. He emphasizes that disturbance of the tissues should be minimal. In his cases the total dose for a primary growth of average size has been from 2.5 to 4 mgm.-hr. given in an exposure of from seven to ten days. Special attention has been paid to the spacing and distribution of the needles and their fixation in place so that every part of the obviously affected tissue is exposed to the irradiation from at least two needles at a distance of not

more than 1 cm. When cervical glands have been obviously involved, the author has preferred irradiation to dissection.

Of ten patients traced from ten to five years after treatment, nine were alive and free from recurrence.

JOSEPH K. NARAY, M.D.

### MOUTH

De Cholnoky, T. Round-Cell, Spindle-Cell, and Neurogenic Sarcomata of the Lip. *Am. J. Cancer* 1934, 23: 548

In a review of the literature the author found the reports of 30 sarcomata of the lip. Most of the records were incomplete. The majority of the sarcomata occurred in persons of advanced years, but 1 occurred in a child. Most of the subjects were women. To the cases found in the literature the author adds 4 cases which were found among the Stuyvesant Square Hospital, New York.

The sarcomata most frequently reported were round cell and spindle cell sarcomata, but lympho-angiosarcomata and melanosisarcomata have also been described. It could not be learned from the reports how many of the neoplasms originated on the mucocutaneous border.

The first case reported by De Cholnoky was that of a woman twenty-one years of age. The tumor was of six months' duration and located on the mucocutaneous border of the upper lip. It was ulcerated. Its exact size is not stated. Microscopic section showed diffuse growth of moderate-sized cells of the lymphoid type invading the muscle and containing many mitoses and many small blood vessels. The diagnosis was round-cell sarcoma.

The second case was that of a man fifty-two years of age who had suffered an acid burn of the face and lip twenty months previously. The lip had never healed in spite of 7 X-ray treatments over a period of three months. The tumor was a hard, lobulated and ulcerated mass measuring 3 by 3 cm. Associated with this growth was a squamous celled epithelioma arranged in interlacing bundles oval or fusiform cells. Sections of the growth showed oval or fusiform cells arranged in interlacing bundles invading the deeper tissues. A nests of epithelial cells are recognized. Four months after operation a deep carcinomatous mass developed in the parotid region. The patient was believed to have separate tumors—a spindle-cell sarcoma of the neurogenic type and a carcinoma. He was still alive six months after the operation.

The third case was that of a man sixty-two years old who sought treatment for a lesion of a few weeks' duration which originated as a "cold sore" and never healed. The lesion was ulcerated and revealed interlacing bundles of fibroblasts invading the lip. The diagnosis was spindle-cell sarcoma.

The fourth case was that of a man sixty-two years old who had a lip lesion of four weeks' duration which began as a "cold sore" and had failed to heal.

The tumor was bluish red, oval, and 1 cm. in diameter. The cells were of the fibroblast type, oval and fusiform, and irregularly interlacing. Scattered fibers. The diagnosis was neurogenic sarcoma. The patient presented no other features of von Reck-Linghausen's disease.

In all of the cases the lesion occurred in the vermilion border and, unlike most sarcomata, ulcerated very early.

LOUIS T. BYARS, M.D.

Friedman, M., and Rubenfeld, S. Malignant Neoplasms of the Upper Respiratory Tract in the Young. *Am. J. Cancer* 1934, 24: 784.

To ascertain the incidence of malignant neoplasms of the upper respiratory passages in the young, the authors reviewed 3,116 cases of neoplasms of the respiratory passages which were treated in the Radiation Therapy Department of Bellevue Hospital, New York, in the period from 1905 to 1931. They found that 5 per cent of the tumors occurred in persons twenty years of age or younger. Fifteen of the tumors developed between the first and fifth years of life, 17 between the sixth and tenth, 14 between the eleventh and fifteenth and 27 between the sixteenth and twentieth.

Of 31 oral malignant tumors, 3 per cent occurred in patients twenty years of age or younger. These included 3 spindle cell sarcomata, 1 lymphosarcoma, and 5 epitheliomata. One of the patients with carcinoma of the tongue has also sarcomatous of the testicle.

The epitheliomata did not occur in the sites in which they usually occur in adults—the sites of maximum irritation—but in the lympho-epithelioma covering the tonsils and in pharyngeal lymphoid patches.

The 9 cases of oral malignancy are reported in detail.

The authors state that the diagnosis of malignancy in the young is frequently missed or delayed because the observer is misled by the patient's age. In a case of sarcoma of the cheek, which was diagnosed very early the condition remained controlled two years after treatment by irradiation. Interstitial or topical irradiation is preferred in malignancy in the young because the delicate skin of children prevents the use of large doses of external irradiation.

LOUIS T. BYARS, M.D.

### PHARYNX

Rosner, F. The Results of the Treatment of Malignant Tumors of the Ear, Nose, Pharynx, and Larynx in the Period from 1924 to 1932. (Ueber das Ergebnisse der Behandlung bösartiger Tumoren des Ohres, der Nase, des Rachens, und des Kehlkopfes aus den Jahren 1924-1932) 1934. Leipzig, Dissertation.

In the period from 1924 to 1932, 300 cases of malignant tumor were treated in the Ear, Nose, and Throat Clinic of the University of Leipzig. The re-

sults were not encouraging. Only 9 (4.47 per cent) of the patients remained free from recurrences and symptoms after four years and only 41 (20.39 per cent) remained free from recurrences and symptoms for from one to four years. Twelve have developed recurrences and metastases, and the others are dead. Of those who died, only a few were benefited for any considerable period. The majority were only slightly or not at all affected by the treatment. In most of them the tumor continued to grow or metastases were formed. Some of them died as the result of the treatment or from complications. A few of those who died received no treatment.

The best results were obtained by thorough operation performed early. Except in a few isolated cases, roentgen irradiation, whether in the form of deep irradiation with large and supplementary doses or with average doses given over a longer period of time, and whether given alone or as postoperative treatment, was of no particular value. Neither did radium treatment nor any combination of treatments prove of much benefit. In all of 13 cases in which the Coutard treatment was used it was followed by breaking down of the tumor. One patient subjected to this treatment was free from recurrence and symptoms for a year, but the others developed recurrences or metastases. The metastases could not be influenced. The Coutard irradiation caused no local injuries, and in only 1 case was its interruption necessary because of the occurrence of a too severe general reaction.

Metastases developed in 83 of the 200 cases, in all of the cases of tonsillar tumors, and in about 50 per cent of those of epipharyngeal, hypopharyngeal, and laryngeal tumors and tumors at the base of the tongue.

Attempts to treat metastases by extirpation or irradiation had no effect.

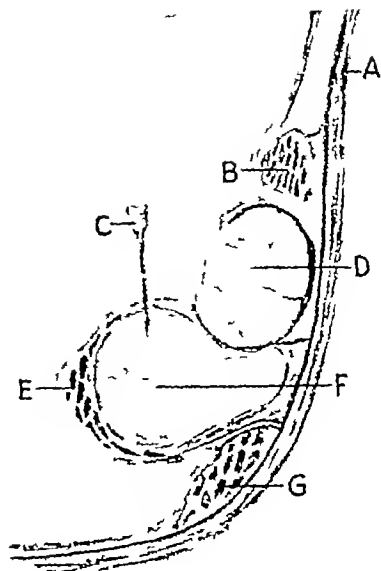
On histological examination, 138 of the tumors were found to be carcinomata, 35, sarcomata, and 21, other forms. In 7 cases section was not done. All of the tumors of the vocal cords and of the external nose and ear and the majority of those of the larynx, hypopharynx, ethmoid, and upper jaw were carcinomata, whereas the majority of the tumors of the epipharynx and tonsils were sarcomata.

Among the tumors of the nasal sinuses, the numbers of carcinomata and sarcomata were about equal. (GERLACH.) JACOB E. KLEIN, M.D.

Wood, G. B. The Peritonsillar Spaces. An Anatomical Study. *Arch. Otolaryngol.*, 1934, 20: 837.

The ease with which the large majority of tonsils can be displaced from their normal position is of great importance in the technique of tonsillectomy. With the dislocation there must occur a disturbance of the normal anatomical relations. The author attempted to discover the nature of the anatomical disturbance.

He found that the tonsil was readily separated from the superior constrictor muscle by a gelatin



The needle, C, inserted just under the mucous membrane of the posterior pillar. The gelatin mass, F, occupies the posterior pillar, comes in contact with the posterior surface of the tonsil, D, but does not spread into the tonsillar fossa or posteriorly into the lateral wall of the pharynx. A indicates the superior constrictor muscle, B, the palatoglossus muscle, E, the palatopharyngeus muscle, and G, the salpingopharyngeus muscle.

mass injected experimentally into the tonsillar fossa. This seemed to prove that there are no firm attachments between the superior constrictor muscle and the tonsillar capsule and that when the tonsil is dislocated toward the midline the space of the peritonsillar areolar tissue is filled in by approximation of the anterior and posterior pillars. However, there was evidence of a firm attachment between the sheath of the palatopharyngeus muscle and the posterior surface of the tonsillar capsule.

Certain barriers to the extension of the injected material were found. Practically all of them run in a longitudinal direction, following more or less closely the arrangement of the faucial musculature. The solution of gelatin injected readily traveled upward and downward, but was definitely limited in its forward and backward extension.

The spread of suppurative conditions within the superior constrictor muscle seems to occur in the same planes as those followed by the gelatin mass in the anatomical injections. When a suppurative process begins in the tonsillar fossa—peritonsillar abscess—it extends upward into the palate, but does not invade the posterior pillar or the posterior pharyngeal wall. However, if the infection starts in the posterior pillar—peritonsillar abscess in the posterior position—the tonsillar fossa and the lateral pharyngeal wall are not involved.

SAMUEL KAHN, M.D.



## INTERNATIONAL ABSTRACT OF SURGERY

## NECK

Goetsch, E. Correct and Incorrect Use of Iodine in the Treatment of Goiter. *Am J Surg* 1934. 26 4 7

Simple colloid goiter the inactive type of parenchymatous goiter commonly develops when the intake of iodine is deficient or the metabolism of iodine in the body is faulty. Simple colloid or endemic goiter may be prevented by the prophylactic administration of minute amounts of iodine together with small amounts of thyroid extract. This is the only type of goiter in which the therapeutic administration of iodine is indicated. The prolonged administration of iodine may occasionally stimulate hyperplasia of the thyroid gland. The indiscriminate administration of iodine may activate a non-toxic goiter and exacerbate the symptoms of toxic goiter. The administration of iodine in pregnancy is indicated only in the presence of inactivity of the thyroid.

The administration of iodine does not prevent the growth and development of true adenoma and has no place in the medical treatment of that condition. Non-toxic adenoma is commonly activated and the symptoms of toxic adenoma are exacerbated by iodine. The acutely toxic adenomatous goiter is often favorably influenced by iodine, particularly when the metabolic rate is high. Adenomata associated with lesser degrees of hyperthyroidism show relatively little improvement and an appreciable number may be made acutely worse by iodine treatment.

When iodine is administered to a patient with Graves disease who has not been given iodine previously, marked clinical remission in the course of the disease is produced. Operation should be performed during the remission. If resection is not done during the remission, relapse often occurs and a condition of uncontrollable hyperthyroidism may result. The gland becomes relatively insensitive to the further administration of iodine. Iodine has little effect in controlling postoperative hyperthyroidism. A hyperthyroid crisis occurring spontaneously in the course of severe Graves disease may be effectively controlled by large amounts of iodine given orally or intravenously. If the crisis is the result of incorrectly administered iodine, the further administration of iodine, even in large amounts, will be ineffectual.

FERO S. MOOREN, M.D.  
Orig. *J Laryngol & Otol* 1934 49 725

Birkett reports case of lipoma of the larynx of intrinsic origin in which laryngofissure as done following preliminary tracheotomy performed under general anesthesia. Opening of the larynx as necessary because, on retraction of the subglottic tissue the tumor extruded through breach in the thyrohyoid membrane. The tumor was encased with ease being free from attachments.

It was proved to be a lipoma by microscopic examination. The case reported is supplemented by illustrations in color.

In conclusion Birkett says that lipoma of the larynx of intrinsic origin is quite rare. He was able to find only four cases reported in the literature.

J. FRANK DOUGLASS, M.D.

Garland, L. H. Carcinoma of the Larynx. *Cal J Surg & Gen Med* 1934 4 289

The Couillard method of treating malignant tumors of the pharynx and larynx by irradiation is based on the fact that cells in state of active mitosis are much more radiosensitive than cells in resting stage. When the time of administration of given dose of irradiation is prolonged, a greater number of tumor cells in state of mitosis are damaged than when the dose is given at once or over a short period. Since normal cells recover from the effects of irradiation more quickly than tumor cells, the tissues tolerate large dose given over a long period of time much better than the same dose concentrated within short period of time.

The radiosensitivity of epithelial tumors differs with the increase in the differentiation and keratinization of the cells. The order of radiosensitivity of tumors of the pharynx and larynx is said to be as follows: small-cell lymphosarcoma, transitional cell sarcoma, lympho-epithelioma, squamous epithelioma, undifferentiated squamous epithelioma, and pearl-forming differentiated epidermoid epithelioma.

In the average case of carcinoma of the larynx the third and fourth week develops weeping exfoliation and the entire thickness of the epidermis over the treated area peels off. However the corium and subcutaneous tissues are not destroyed and within another two weeks complete regeneration occurs. The fact that no other tissues are destroyed or necrosed differentiates this benign epidermal from true cornifying necrosis. Concomitant with the epidermal necrosis is mucositis involving the larynx. Couillard treats the patient until marked by that time and if its histological appearance suggests that it is of the anaplastic type, the treatment is discontinued. If the tumor is of the highly differentiated type, the treatment may be continued according to the judgment and experience of the radiotherapist. The chief danger of moderate overdosage is the effect on connective tissue which prevents or delays complete healing. Ex treme overdosage is followed by necrosis of bone and cartilage.

The author presents nine cases treated by modified Couillard technique. Of four patients with moderate lesions, three are living with the condition clinically arrested and one died of bronchopneumonia. The pulmonary becomes shortly after the treatment as begun. One patient treated for postoperative recurrence classified as moderate and

clinically well. Of three patients treated for an advanced postoperative recurrence, all are dead. One of these showed no improvement after the treatment, but two showed definite and remarkable improvement. One patient with an advanced lesion who was not operated upon has shown no change since the irradiation.

A comparison of the results of irradiation and surgical treatment in several recently reported series of cases reveals that the best radiological results are exactly twice as good as the best surgical results at the end of four years, while the mortality of surgery is considerably greater than that of irradiation. Final judgment must, of course, be held in abeyance until the follow-up observations have been made over a much longer period of time.

The author's conclusions are as follows:

1 Many cases of carcinoma of the larynx can apparently be cured by adequate, carefully administered roentgen therapy.

2 As none of the nine patients whose cases are reviewed has been observed for a period of five years, the number of clinical cures cannot be stated. However four patients are clinically well at the present time.

3 There was no mortality directly attributable to the roentgen therapy in the reviewed series of cases. No late necrosis of cartilage or bone, and no pharyngeal obstructions developed following the irradiation. Nevertheless, such complications may be expected to arise occasionally in a sufficiently large series of cases.

4 Roentgen therapy avoids destruction of the voice and in the cases reviewed it resulted in no disfigurement of the neck.

5 The choice of therapeutic attack in cancer of the larynx appears to be a joint problem for the radiologist and surgeon. The indications for one or the other or both procedures vary in different cases.

ARTHUR S. W. Touroff, M.D.

# SURGERY OF THE NERVOUS SYSTEM

## BRAIN AND ITS COVERINGS; CRANIAL NERVES

Zorrain, G., Poo, M. B., and Urcaray, L.: Treatment of Apoplexy of the Cerebral Cell in Traumatic Accidents and Their Vascular Complications by Subcutaneous Injection of Carbon Dioxide (Tratamiento de la lesión de la célula cerebral en los accidentes traumáticos y sus complicaciones vasculares por las inyecciones subcutáneas de ácido carbónico). *Rev. Arg. Med. Soc. de Ciruj. de Buenos Aires* 624, 8 1933

The authors present a preliminary report of experiments in which dogs rendered comatose by injections of carbon dioxide. The injections were followed by improvement of respiration and a rapid return of consciousness unless the trauma was too severe, when only respiratory improvement occurred and death was merely delayed. As much as 400 c. cm. of carbon dioxide per kilogram of body weight was injected. The injections produced only tachypnea without cyanosis.

From the results the authors conclude that in concussion there is a stimulation of the sympathetic with vasoconstriction which produces cerebral ischemia and partial asphyxia of the nerve tissue. Carbon dioxide inhibits the sympathetic, thus relieving the primary condition of concussion and its accompanying respiratory disturbances and improving the circulation. In addition it stimulates the respiratory center, it exerts a stimulating effect and direct peripheral vasodilator action on the capillaries. The latter accounts for the relief of the cerebral asphyxia. The injection of carbon dioxide only accelerates the biological respiratory rhythm, provoking a slight transient asphyxia and stimulating the medulla directly by the free gas.

The authors report three clinical cases which are treated by the subcutaneous administration of carbon dioxide. The first was case of fracture at the base of the skull complicated by meningeal hemorrhage. The patient recovered by meningeal not mentally and later diagnosis of multiple cerebral fibrosis was made. The second case was one of head trauma—probably fracture with intracranial hemorrhage—and other injuries. Although each injection produced temporary improvement, the patient died in about 12 hours. The third case, a case of shock and concussion due to street-car accident, a single injection resulted in immediate and continued improvement.

The authors use the carbodental sparklet with modified outlet and a connection invented by Zorrain which attaches to hypodermic needle. The apparatus and in case are described with the aid of

illustrations. The pressure, velocity and quantity of the gas can be determined and controlled. The dose is from 1,400 to 1,500 c. cm. injected over a period of from forty to sixty minutes. As the sparklet continues to hold, in the space of about 10 c. cm. and under a pressure of 100 lb. about 1,500 c. cm. of carbon dioxide at atmospheric pressure they are very convenient. The effect of the injection show for several hours as diffusion in the tissue is slow. The treatment is particularly valuable in concussion, skull fractures, coma from traumatic or vascular causes, popleptic attacks of various kinds, and other sequelae of vascular spasm.

M. E. Moore, M.D.

Villaverde, V.: A New Technique for the Treatment of Traumatic Block of the Ventricle (Un nuevo método para el tratamiento de bloqueos ventriculares traumáticos). *J. de cir.* 244, 44 15

The author notes that traumatic block of the ventricle is generally considered an indication for operation. The mortality of this type of lesion is high, as is shown by the statistics of various series. In the author's opinion, the high mortality is due partly to failure to make an exact diagnosis and partly to the fact that the surgical measures used have been based too exclusively on anatomical considerations without sufficient regard to the physiopathological aspects of the lesion.

In trauma of the brain blocking of the route of communication between the ventricle and the extraventricular spaces may occur with consequent interference with the circulation and absorption of the cerebrospinal fluid. The operation devised by the author to relieve this condition of ventricular block is designed to establish a vascular circuit gradual decompression, and maintain a normal or nearly normal intraventricular pressure. It is first done experimentally on dogs and when found to be safe, causing no secondary symptoms and relieving the symptoms of ventricular block, was adapted for use in clinical cases. In clinical cases, local anesthesia induced with novocaine is used. The center of the incision is at the point of intersection of two lines, one vertical, 3 cm. behind the external auditory canal, and the other perpendicular passing 3.5 cm. above that canal. The incision is vertical and 4 cm. long. The bone is exposed and trephined by the usual technique. A special trocar 5 cm. long and 3 mm. in diameter is used with stylet tapering to a point similar to those contents needle. At the extremity which is to rest against the cranium the trocar has two lateral wings parallel with its axis. The trocar with its stylet is introduced

through a very small incision in the meninges so that it is perpendicular to the cerebral cortex. When introduced its full length up to the lateral wings, it reaches the ventricular cavity. The stylet is then slowly withdrawn so that the cerebrospinal fluid escapes drop by drop. When no more fluid escapes the stylet is completely withdrawn and three silk threads are placed in the lumen of the trocar and pushed in gently with the stylet. It is not necessary for these threads to be in the ventricular cavity. The trocar is fixed in place by means of its lateral wings. The ends of the silk threads are fixed in the cellular tissue of the sternomastoid region. The trocar and the silk threads are left *in situ* until the symptoms of intracranial hypertension and commotio cerebri disappear—from the ninth to the twenty-fourth day in the author's cases. No symptoms of intolerance to the presence of the trocar have developed in any case. This operation has been done in eleven cases. Two of the patients died within twenty-four hours, but as autopsy showed severe cerebral lesions and extensive hemorrhages in both of them their deaths cannot be attributed to the operation. The nine other patients made an excellent recovery without complications. The first patient was operated on in April, 1931, and has recently reported himself entirely well. The other patients have not been traced since their discharge from the hospital, but were under observation for sixty days and showed no mental or neurological symptoms when they were discharged. The eleven cases are reported in detail.

ALICE M. MEYERS

Stier, E. The Importance of Investigation of the Equilibrium Apparatus for the Judgment of Old Head Injuries (Die Bedeutung der Untersuchung des Gleichgewichtsapparates fuer die Begutachtung alter Kopfverletzungen) *Monatsschrift Unfallheilk.*, 1934, 41, 385

After a general discussion of the important points of view in judging skull injuries and a detailed discussion of the importance of vestibular disturbances in such injuries, the author reports his own investigations.

Of thirty-seven clearly proved cases of fracture of the vault of the cranium, he found an appreciable difference in the excitability of the vestibular nerve in only one, and in this case it was due to a central injury. Among twenty-nine basal fractures in the region of the temporal bone, there were five fractures of the bony capsule of the labyrinth with complete destruction of the eighth cranial nerve. In four cases the vertigo which at first was very severe was so greatly alleviated by central compensation after a few years that the patients regained almost full working capacity. In all of the other cases the injury to the vestibular nerve was much less severe and the tendency toward improvement so great that in one-third of the cases no limitation of working capacity was apparent after one or two years. According to these findings, the majority of patients

complaining of vertigo after basal fractures receive accident compensation much too long.

Of seventy-three cases of concussion of the brain, a complaint of vertigo was made in only thirty-seven. It was possible to demonstrate a unilateral disturbance objectively in only ten of these thirty-seven cases. In four of the ten there was a peripheral injury with a suspected basal fracture, and in the remaining six there were central disturbances which probably had their origin in small hemorrhages. Of eight cases of unilateral central injury to the vestibular nerve after head trauma, only five presented the picture of concussion of the brain. It therefore seems apparent that a simple concussion of the brain usually does not produce injury to the vestibular nerve and that, on the other hand, circumscribed hemorrhages in the brain may give rise to vestibular nerve disturbances in the absence of all other symptoms.

(L. DUSCHL) FLORENCE ANNAN CARPENTER.

Rohde, W. Primary Melanotic Tumors of the Central Nervous System and Its Membranes (Ueber primäre melanotische Tumoren des Zentralnervensystems und seiner Hüllen) 1934 Hamburg, Dissertation

The author reports the case of a fifty-year-old woman who had hairy pigmented naevi on the face and extremities (on the latter as large as the palm of the hand) and came to operation with the symptoms of brain tumor. The tumor was not found on trephination and the patient died two days after the operation. Autopsy revealed a large melanotic tumor in the left temporal lobe.

According to the findings of histological examination, the tumor had its origin in the inner leaf of the pia mater. The cells contained pigment and were arranged in groups, packets, and thick strands. External to the tumor, cells filled with pigment were found on the inner leaf of the pia in addition to normal endothelium-like cells. The tumor had displaced the brain tissue, but had not infiltrated it. None of the sections of skin naevi examined showed signs of malignancy. The author cites about thirty similar cases from the literature. The melanotic pial tumor was regarded, not as a metastasis, but as a primary tumor developing from the meninges.

Rohde next discusses the various theories of origin of the pigment. According to some the pigment is derived exclusively from the outer germinal layer, while according to others it originates also from the endothelium arising from the mesenchyme. (LEHMANN) FLORENCE ANNAN CARPENTER.

Puech, P., and Stuhl, L. Roentgen Study of Tumors of the Hypophysis and the Hypophyseal Region (Contribution à l'étude radiologique des tumeurs de l'hypophyse et de la région hypophysaire) *Presse méd.*, Par., 1934, No. 92, 1849

Roentgen examination is of great importance in the localization of tumors in and near the hypo-

physic. In some cases it may show the histological nature of the tumor. It serves also to differentiate intrasellar tumors from certain tumors at a distance—tumors of the posterior fossa, for example—which affect the hypophysis and its nerves and stimulate tumors of the hypophysis clinically.

The roentgenogram of true tumors of the hypophysis—adenomas and craniopharyngiomas—is quite characteristic. In cases of chromophobe adenoma the sella is enlarged in all its diameters and its walls are thinned. The enlargement occurs particularly in the anteroposterior direction. The floor is horizontal, and the anterior and posterior clinoid processes are small, tapered, and less opaque than usual. In cases of acidophobe adenoma the enlargement occurs in the vertical direction and is accompanied by sclerotic changes. The walls are thick and the clinoid processes are long and hypertrophied although their lower surfaces are eroded. The tubercle of the sella is abnormally protruding, forming a beak between the two optic nerves. This characteristic beak may interfere with surgical removal of the adenoma.

Craniopharyngiomas are generally suprasellar but in some cases develop in the sella itself. Occasionally they are intrahypophyseal. They cause not only changes in the sella, which vary with their location, but also calcifications, which are generally suprasellar.

Extrasellar tumors, which include suprasellar meningiomas of the tubercle of the sella, gliomas of the chiasm and optic nerves, laterosellar meningiomas of the lower wing of the sphenoid, aneurysms, presellar olfactory meningiomas, and bone hemangiomas produce less characteristic pictures, but some signs which, in conjunction with the clinical picture, are of aid in their diagnosis. The diagnosis may be confirmed by pre-operative ventriculography. *ARTHUR GOS MORGAN, M.D.*

Kornblith, R. and Osmond, L. H. Deformation of the Sella Turcica by Tumors in the Pituitary Fossa. *Ann Surg.* 1935 70

The authors review seventy-four cases of tumor of the pituitary fossa in which careful roentgenological examination was made and the findings were verified at either operation or a autopsy. They state that in roentgenography of the pituitary fossa it is absolutely essential to obtain at least one true lateral roentgenogram in which bilateral tractors are superimposed. For this purpose it is best to have the patient sitting or lying prone and to use special Bucky diaphragm adapted for these positions. A satisfactory picture cannot be obtained by having the patient turn his head onto the plate as when this is done distortion usually results. If stereoscopic films are desired, they may be obtained by moving the tube the full length of the stereoscopic shift forward or backward. In the average adult skull the pituitary fossa is 8 mm in depth and 15 mm in the anteroposterior diameter. The highest normal for these measurements is 10 mm and 18 mm.

The cardinal changes occurring in deformations of the sella turcica, regardless of the location of the tumor, are: (1) atrophy of the dorsum sellae; (2) erosion of the floor of the pituitary fossa; (3) an increase in the size of the fossa (average, 25 mm in the anteroposterior diameter and 16 mm in depth). There is always definite evidence of erosion of the anterior surface of the dorsum sellae. This surface becomes thinner and frequently appears elongated. The posterior clinoid processes usually remain intact even when the tumor reaches enormous proportions. With complete disappearance of the dorsum sellae the diagnosis of intrasellar tumor becomes less certain. Of the cases studied, there was definite X-ray evidence of erosion in over 97 per cent.

Erosion of the floor is an almost invariable accompaniment of intrasellar tumors and usually is quite marked. It is manifested chiefly by definite enlargement of the pituitary fossa. Except for enlargement, the floor may present normal appearance. It may appear to be made up of multiple lines which cause difficulty in determining the true level. It may have the appearance of double bottom, or it may seem to have disappeared completely. Under the latter conditions the tumor may appear to be suspended in the sphenoidal sinus.

There is usually some change in the appearance of the clinoid processes, and the tuberculum sellae commonly shows a pointed deformity.

Of considerable importance in the roentgen recognition of pituitary tumors is the complete absence of other X-ray manifestations of an intracranial neoplasm. Of the various types of deformities of the sella turcica produced by intracranial neoplasms, the deformity resulting from an intrasellar tumor is the only one that is in any way pathognomonic. In the majority of cases it is sufficiently characteristic to establish the diagnosis of pituitary tumor. While a tumor requiring surgical intervention was evident without deforming the sella turcica, this is so rare that the clinical evidence must furnish positive proof of such a lesion before surgery is warranted.

*JOHN WILLIAMS PERRY, M.D.*

Salado, M. and Farrel, R. Surgical Treatment of Hypophyseal and Perihypophyseal Tumors (Tratamiento quirúrgico de los tumores hipofisarios y perihipofisarios). *Arch. argent. de neuro.* 1934 7

The authors report three suprasellar meningiomas, four gliomas of the chiasm, six craniopharyngiomas, congenital prolapse of the intradumbilar cavity (similar to the condition in the lower extremity with a thistle in its walls, and a hypophyseal diverticulum with terminal meningocele). They conclude that the most significant sign of such growths is bitemporal hemianopsia, and the next most significant sign, temporal hemianopsia of one eye with blindness of the other.

Positive roentgenological signs are found in the sella turcica in 80 per cent of cases of hypophyseal tumor. In cases of perihypophyseal tumor on the

other hand, the sella is negative. The cerebrospinal fluid is always normal as regards both protein and cells.

Of the cases reviewed, a typical hypophyseal operation with the formation of a frontotemporal flap was done in twenty-two, a right-sided decompression in five, and section of the corpus callosum with ventricular exploration in three. In fifteen, no operation was performed. In all of the cases in which an operation was done iodoventriculography was positive and of great aid in the localization of the tumor. In the cases of hypophyseal tumor there were twenty-one operations with four deaths. In three of the cases of adenoma the large size of the tumor explained the immediate postoperative death. The one patient who was treated for sarcoma is living three years after the operation. In the cases of meningioma there were no deaths. One of the three patients operated upon for glioma of the optic tract died two months after the operation. Four patients operated upon elsewhere by the intranasal route were operated upon a second time.

The authors have used deep radiotherapy extensively and consider it partly responsible for the excellent postoperative results.

The tumors of Rathke's pouch constitute a special problem. The authors' cases of such tumors came for treatment after the stage of blindness had been reached, and five of the six were fatal. The first intervention, after the position of the tumor is determined by iodoventriculography, should be a simple right-sided decompression. If this is insufficient it is necessary to section the corpus callosum and treat the tumor directly.

Of the authors' cases of tumor which were not operated upon, four were diagnosed for the first time at autopsy, two terminated in death very rapidly without treatment, and in the others the narrowing of the visual fields and the amblyopia increased progressively in spite of radiotherapy and intranasal procedures.

M E MORSE M D

Elsberg, C A, and Dyke, C G. Meningioma Attached to the Mesial Part of the Sphenoid Ridge with the Syndrome of Unilateral Optic Atrophy, a Defect in the Visual Field of the Same Eye, and Changes in the Sella Turcica and in the Shape of the Interpeduncular Cistern After Encephalography. *Arch Ophth*, 1934, 12: 644.

The authors describe a characteristic syndrome of small meningeal growths arising from the mesial part of the sphenoid ridge. For a considerable period such growths produce disturbances due solely to pressure on the nerve near the optic foramen.

The syndrome of primary optic atrophy of the optic nerve with bitemporal defects of the visual fields and progressive diminution of vision is characteristic of tumors which compress the optic chiasm and nerves and is often the first and for a long time, the only, clinical evidence of a midline growth under the frontal lobes of the brain. The combination of primary atrophy of the optic nerve, bitemporal

defects in the visual fields and changes in the sella turcica was formerly believed to be characteristic only of tumors of the hypophysis. It is now known that the chiasmal syndrome may be produced by cysts or solid growths derived from the bucconeural pouch or infundibular stalk, by primary gliomata of the optic chiasm, by localized inflammatory processes in the leptomeninges, and by midline meningioma attached to the basilar dura of the anterior or middle cranial fossa.

In 1927 Holmes and Sargent reported a series of cases of suprasellar meningioma in most of which operation was performed after the growth had become large. Early recognition in the stage when visual disturbances are the only signs was due to Cushing. The sella turcica often shows changes without the appearance characteristic of intrasellar growths. As the result of the report of Cushing and Eisenhardt, the combination of primary atrophy of the optic nerve and bitemporal defects of the visual fields with slight changes in the sella turcica but without any other symptoms of intracranial tumor became recognized as a syndrome produced by slowly growing meningioma in the neighborhood of the optic chiasm.

Meningioma arising from the dura of the upper surface of the lesser sphenoid wing and those attached to the lateral part of the sphenoid ridge do not press on the chiasm until they are large. After they attain a considerable size they may cause bilateral papilloedema or primary atrophy or primary atrophy in one eye and papilloedema in the other. Concentric contraction of the fields or homonymous hemianopia may occur. According to the authors' experience, the so-called Kennedy syndrome is infrequent and occurs only in cases of large growths in or under one frontal lobe.

An important contribution to our knowledge of the life history of these growths was the discovery that the neoplasms arise and become attached more frequently at certain sites than at others. Among the most common sites of their dural attachment are (1) the tuberculum sellæ, (2) the olfactory groove and cribriform plate, (3) the roof of the orbit, (4) the superior surface of the lesser wing of the sphenoid, (5) the outer part of the sphenoid ridge, and (6) the mesial part of the sphenoid ridge. In the roof of the orbit, on the superior surface of the lesser wing of the sphenoid, and in the outer part of the sphenoid ridge small meningioma do not come into contact with structures having a specialized function and therefore do not cause symptoms early. Meningioma derived from the dura of the tuberculum sellæ produce visual disturbances early. Small growths attached to the dura of the olfactory groove cause unilateral disturbances of smell very early. More delicate olfactory tests would allow their earlier diagnosis. Growths derived from the dura of the mesial part of the sphenoid ridge can be identified early by study of the visual field and the demonstration of changes in the basal cisterns by encephalography.

## INTERNATIONAL ABSTRACT OF SURGERY

The authors report four cases in which there were unilateral visual disturbances with field defects of one eye due to a growth attached to the nasal part of one sphenoid ridge. In three of these cases there were no disturbances of any other cranial nerves, but in one there was complete anoma of the optic nerves. In all of the cases characteristic changes in the shape of the sphenoid and maxillary ridges by encephalography.

The defects in the visual field were due to pressure on the nerve near the optic foramen which affected most the lower fibers of the nerve.

A similar clinical picture may be produced by meningioma and other benign growths arising from the sheath of the optic nerve within the orbital cavity and by aneurysms of the cavernous part of the internal carotid artery. The former cause no changes in the sella turcica or bony structures of the basal cisterns. In cases of aneurysm there is usually involvement of the oculomotor, abducens, and trochlear division of the trigeminal nerves. Calcification in the wall of the sac is often visible in roentgenograms of the skull. The authors report case of aneurysm to which the findings suggested the presence of tumor. Recurrent attacks of herpes of the cheek and swelling of the eyelids suggest lesion of the cavernous sinus. Among other intracranial conditions which may cause unilateral visual disturbances and field defects are usually bilateral arachnoiditis (which however is usually bilateral) and craniotomies. In a case of craniotomies discussed by the authors the roentgenograms showed the characteristic changes of craniotomies and showed the interpeduncular cistern to be normal in size and outline.

The surgical approach must always be on the side of the affected nerve.

Dyke discusses the normal and abnormal findings of encephalography discusses the anatomy of the region about the chiasm and sella turcica, and describes the changes produced by the various types of lesions in that area.

Edward S. Platt, M.D.

Dool, A. R. Operative Treatment of Facial Palsy  
Brit. M. J. 1934, 257

Dool reviews experimental work on nerve grafts which he carried out with Balfance. It was found that when all nerve degeneration was permitted to occur in the graft before transplantation the results were restored in from one-fourth to one-half the time required by fresh grafts. The anterior femoral cutaneous nerve was divided the desired length with care to avoid disturbing the nerve in its bed. The degeneration in the nerve to be used required from two to three weeks.

In forty of six hundred cases operated upon, grafts described in detail his method of exposing the canal and preparing the bed for the graft. The shortest gap to be grafted the cases reviewed was 7 mm and the longest, 4 mm. In the forty cases in which

grafting was done in the fallopian canal, the average gap was 30 mm long.

Dool states that operation is indicated in any case in which there is galvanic response in the muscles sufficient to prove that the muscles have not undergone too much fibrous atrophy. His explanation is that the nerve can always be repaired, and that if a sufficient number of muscle fibers remain in repair will be followed by marked improvement. His reports that in several of his cases of Bell's palsy which had previously remained unchanged for many years, improvement followed incision of the sheath of the nerve.

## SPINAL CORD AND ITS COVERINGS

Haworth, R. M. The Treatment of Syringomyelia  
by X Rays. Brit. J. Radiol. 1934, 7, 443.

The author discusses the history and pathology of syringomyelia and reports six cases which show that roentgen-ray irradiation is a very valuable means of treating the disease. It states that most observers seem to agree that roentgen irradiation is followed by a marked improvement in the subjective symptoms without a corresponding objective change, and that the duration of the onset of the illness bears a important relationship to the results of the treatment. Failures are most likely to occur in cases in which there was at least a five-year history before the institution of treatment. Even in such cases, however the progress of the disease may be arrested. As a rule the first symptom to be relieved is pain. Relief of the pain is followed first by improvement in muscular power and later by sensation and trophic changes. Although statistics that roentgen irradiation is of great value.

T. Hypotheses are advanced to account for the favorable results. According to one, the newly formed nerve fibers present as the condition is extremely sensitive to small doses of roentgen rays. According to the other, the normal neuroglia degenerates because of vascularization of the cord by the proliferation of young blood vessels, the latter are extremely radiosensitive, and it is the destruction of these young blood vessels by the roentgen rays that causes the arrest of the process.

The technique has differed considerably. Many of the earlier workers used small doses over a period of many weeks. More recently the tendency is to give large doses of hard rays at long intervals. The author describes various techniques in detail. The administration of from 50 to 350 rads of hard rays is systematically increased time intervals. The author's six cases are reported in detail. In general, the results are similar to those reported by previous observers except that the treatment was successful to some extent in all of them.

Haworth draws the following conclusions:  
Irradiation must be regarded as having an established place in the treatment of syringomyelia.

- 2 The technique appears to be of minor importance as many techniques have been successful
- 3 Early diagnosis is important
- 4 The pain sometimes associated with the condition can be relieved by irradiation

ADOLPH HARTUNG, M D

### SYMPATHETIC NERVES

Davis, A. A. The Surgical Anatomy of the Presacral Nerve *J Obst & Gynec Brit Emp*, 1934, 41 942

The presacral nerve is the portion of the abdominal sympathetic system which lies anterior to the bodies of the fourth and fifth lumbar vertebræ in the space between the common iliac arteries. Above and laterally, it is connected with the solar plexus and upper lumbar ganglia through the intermesenteric nerves of which it is the direct continuation downward. In the midline, the plexus is connected above with the inferior mesenteric ganglion or the inferior mesenteric circumarterial plexus. Laterally, it receives a branch from the lowest lumbar ganglion on each side. Below, it terminates by dividing into the paired inferior hypogastric plexus. The latter usually consists of two long nerves united by many oblique anastomoses.

Morphologically, the presacral nerve presents many variations. The most common are (1) a narrow plexus of two or more parallel nerves, (2) a true or single presacral nerve, and (3) a wide plexus of

parallel nerves. Less common forms are (1) a false presacral nerve, a spider-web plexus, and (2) a wide plexiform nerve. The plexus gives off branches to the superior hæmorrhoidal artery, external iliac artery, and middle sacral artery.

The presacral nerve lies behind the peritoneum, somewhat to the left of the midline, on the bodies of the fourth and fifth lumbar vertebræ, from which it is separated by a dense sheet of fibrocellular connective tissue. The fibrous lamina is easily separated from the plexus and from the lumbar vertebræ behind. The middle sacral artery intervenes between it and the bone in the midline. Below the promontory it rapidly becomes adherent, eventually merging with the sacral periosteum. The anterior surface of the plexus is covered similarly with a finer but still definite layer of connective tissue, the locally condensed subperitoneal areolar tissue. The two laminae fuse at the lateral borders of the plexus, which is thus isolated within a fibrous sheath. This disposition is of considerable practical importance as it allows complete extirpation of the plexus without isolation of its constituent nerves and without danger to the subjacent vital structures. The relation of the plexus to the great vessels varies with the level of the aortic bifurcation and the direction of its branches. As a rule, half of it lies upon the left common iliac vein and half upon the bone. The left ureter and the pelvic mesocolon and its vessels are usually situated well to the left of the presacral nerve.

DAVID JOHN IMPASTATO, M.D



# SURGERY OF THE CHEST

## CHEST WALL AND BREAST

Tod, M. C., and Dawson, E. K. The Diagnosis and Treatment of Doubtful Mammary Tumors. *Lancet*, 1914, 7, 64.

Definitely malignant tumors of the breast require urgent surgical treatment, whereas temporary and possibly painful mammary enlargements associated with menstruation or the menopause rarely require surgical interference. Between these two extremes are the benign tumors and the tumors generally referred to as doubtful, borderline, or suspicious, the treatment of which ranges from local excision to radical mastectomy depending upon the experience and judgment of the surgeon. Because of the wide divergence of opinion regarding the type of procedure indicated, the authors (attempted to obtain a guide from study of their pathological material, operative procedures, and follow-up results. They stress the difficulties of clinical diagnosis and the frequent necessity of relying on microscopic cases. Their views as to treatment may be summarized as follows:

In the cases of young individuals, local excision is adequate for fibro-adenoma and possibly for certain chronic infections. In the cases of patients over thirty-five years of age, simple mastectomy is indicated and is preferred to local excision for these conditions.

Simple mastectomy is to be recommended for all cases in which there is doubt as to the presence of malignancy. In the exception of the cases previously mentioned and cases of acute carcinoma in situ, pregnancy and lactation tumors. With these exceptions, simple amputation with gross examination will often solve the problem of diagnosis. If malignancy is present, radical operation should be performed; if not, whereas if the lesion is benign, nothing further need be done. If diagnosis is impossible by gross examination, a choice must be made between (1) immediate radical mastectomy and (2) later microscopic examination followed by secondary radical extirpation or irradiation alone. If malignancy is demonstrated. The two-stage operation is not dangerous if radical removal is not delayed too long.

Radical mastectomy as a primary procedure should be carried out in all cases of obvious malignancy and immediately after simple mastectomy when gross clinical borderline tumor to be malignant.

The chief conclusion drawn by the authors is that diagnostic simple mastectomy is the best initial stage of treatment of doubtful tumors of the breast in the cancer zone. *Ann. S. W. Tuckey M.D.*

## TRACHEA, LUNGS, AND PLEURA

Krause, H. The Influence of Different Degrees of Distention upon the Blood Flow Through the Lung. (*Einfluss verschiedener Dehnungsgrade auf die Durchblutung der Lunge*). *Deutsche Zeitschrift für Chirurgie*, 1914, 143, 505.

A review of the literature shows that up to date there is no unanimity of opinion regarding the perfusion of blood in the collapsed lung. Some investigators believe that the perfusion is increased whereas others have found it decreased. In spite of very extensive experience in directly viewing and estimating the perfusion of blood in the lungs during intrathoracic operations and in spite of extensive knowledge gained from his experimental studies, Sewerbroock concluded that the question of perfusion of blood in the collapsed lung has not yet been definitely answered.

Krause reports experiments carried out to determine better and in what manner varying degrees of distention exert a mechanical influence on the perfusion of the lung. The amount of perfusion in the lung in different degrees of distention can be determined by means of the heart lung preparation named after Starling. This consists essentially in exclusion of the greater circulation. The heart and lesser circulation remains entirely intact and unchanged. The greater circulation is replaced by an artificially closed system through which the left ventricle sends its blood. This consists of four parts: (1) an arterial resistance as a substitute for the vascular resistance in the greater circulation, (2) a rheometer (3) an apparatus for measuring the perfusing blood and (4) a regulator of the venous pressure. The Starling apparatus is shown in an illustration, and the experiments are reported in detail.

In the experiment described the blood sent from the right heart through the lungs comes out of the left heart into the artificial greater circulation which is provided with the necessary arrangements for measurement. When no excess or different flow of blood occurs in the inflow apparatus and there is no leak in the preparation the delivery between the right and left ventricle is balanced. This condition is established spontaneously in a few seconds and can be recognized from the constancy of the curves. The volume coming through the greater circulation is easily measured and compared with the flow through the lungs. (Strictly speaking, this is less by the amount of the volume of the coronary arteries.) As this volume is almost constant when the aortic pressure is fairly constant, measurement in the greater circulation in place of measurement in the pulmonary artery is reliable and

sufficient as the purpose of the study is to determine only the difference in the perfusion in different degrees of distention of the lung and not the absolute amount of the perfusion. As the result of the exclusion of the greater circulation in the experimental animal the central regulation of the respiration is also eliminated and artificial respiration is necessary. It is therefore possible to investigate not only the influence of the frequency and depth of respiration, but also that of pulmonary inflation resulting from varying degrees of obstruction to expiration. The volume of perfusion in the lung under a constant respiratory pressure can also be measured. As compared with normal respiration there is of course a difference as the respiration is not a suction breathing but a pressure respiration. For distention of the pulmonary vessels and the difference in pressure between the right ventricle and the left auricle which is necessary to overcome friction within them, there is no physical difference between normal respiration with a closed thorax and positive pressure respiration with an open thorax as the heart and the pleural space remain under the same surrounding pressure.

The following records are made in every experiment: (1) the average aortic pressure determined with a mercury manometer at the free leg of the cannula in the innominate artery, (2) the average pressure in the right auricle determined with a water manometer through a cannula inserted through the inferior vena cava into the right auricle for control of the inflow of blood, (3) the average pressure in the pulmonary artery determined with a water manometer in a branch in the upper lobe of the right lung, (4) the perfusion volume of the greater circulation determined by the Stolnikov method, (5) the intratracheal air pressure determined with a Marey capsule placed toward the trachea in the Y-cannula, and (6) the time in seconds determined by Jacquet time marking. These six registrations are made on an optic kymograph by shadow projection. In addition, the temperature of the blood is measured with a thermometer in the cannula of the superior vena cava and read when the stream volume is measured.

The experiments showed that in the heart-lung preparation of Starling the minute volume falls with increasing distention of the lung. It is immaterial whether the pulmonary distention is produced by constant pressure, deep respiration with expiratory collapse, or rhythmical forced breathing. In spite of the falling minute volume, the average pressure in the pulmonary artery is increased as the result of increasing resistance in the pulmonary stream bed. In very marked distention failure of the lesser circulation may occur.

When the respiratory air is constant and the pulmonary distention is moderate, no distinct influence is exerted on the stream volume by the frequency of respiration.

Complete collapse as compared with moderate distention of the lung shows a diminution of the

minute volume. A simultaneous decrease of the average pressure in the pulmonary artery with an increase in the stream volume during the forced respiration of a collapsed lung is caused by a decrease in the resistance in the stream bed in the lung.

With constant distention of a collapsed lung the minute volume increases from 3 to 6 per cent, but with distention of the collapsed lung by slight to moderate rhythmical forced respiration it increases from 17 to 22 per cent. Comparison of these figures apparently shows that in a lung in forced respiration the resistance in the stream bed is less than in a lung equally distended but not subjected to forced respiration. Therefore, in the respiratory rhythm there may be a force which strengthens the pulmonary perfusion and is manifested by the decrease in the average resistance in the pulmonary stream bed.

With exclusion of half of the stream bed of the lung the stream volume diminishes only about 10 per cent, but when the entire lung with the exception of one lobe is excluded the stream volume diminishes about 57 per cent.

The clinical results of the experiments show the hemodynamic behavior of the pulmonary vessels and reveal the influence of various degrees of distention upon the pulmonary stream bed. The changes are manifested not only in the resistance and the amount of perfusion, but also in the amount of blood in the lungs. The changes in the pulmonary circulation constitute only a part of the process taking place during respiration. The described changes in the stream bed are of clinical importance only when the right heart is no longer able to meet increased demands.

However, for the surgeon the results have special interest because they constitute the basis for an understanding of the effect of certain therapeutic procedures and of disturbances during and after operative interventions in the thoracic cavity. For example, pulmonary collapse therapy is based upon an artificially produced relaxation of the lung obtained by pneumothorax or removal of bone from the thoracic wall. It has long been believed that the curative processes begin with a change in the perfusion, but up to the present time the nature of this change could not be determined with certainty. Experiments have shown that optimal perfusion occurs, not when the lung is collapsed completely, but when there is slight distention or forced breathing equal to a movement of from 3 to 15 mm. of the edge of the lung. Therefore it is evident that the optimal effect of pneumothorax is obtained, not with positive pressure causing complete collapse and complete cessation of respiratory movements, but only when there is still a slight distention or respiratory movement in the relaxed lung. Under the latter conditions a specially favorable perfusion of the lung is obtained. This theory of perfusion in the relaxed lung applies of course also to all other constricting measures such as thoracoplasty, paraffin filling, and exeresis of the phrenic nerve. Therefore during the operation it is important to adjust the

## INTERNATIONAL ABSTRACT OF SURGERY

differential pressure apparatus so that when the thorax is open the best possible perfusion—alight respiratory movement of the collapsed lung—is still possible. This empirically discovered fact has been proved by the experiments herewith reported.

Heretofore it was believed that the pulmonary distention at the end of intrathoracic interventions should be such that the pulmonary surface was in close contact with the inner surface of the thoracic wall. However, marked distention is not always desirable. In other words, it is better if a slight pneumothorax persists. This theory may explain the fact that pneumothorax is very rare following intra-thoracic interventions or at any rate, occurs much less frequently after such operations than after interventions in the upper abdomen. When the distention at the end of the operation is moderate the circulation is better and engorgement is less likely to occur.

Recently, relaxation therapy has been applied on the affected side of the lung in postoperative pneumothorax. Its successful results. The beneficial effect is explained by the findings of the author's experiments. As in all inflammatory processes hyperemia causes the inflammation to disappear more quickly and renders it less harmful, the effect of this treatment is due to the improved perfusion of the affected lung.

(Lorenz) Lorenz Neuwelt, M.D.  
Ringer P. H. Surgery to Pulmonary Tuberculosis  
(An Increasing Importance. *Souds Surgery*, 1934, 3)

Ringer discusses the surgical treatment of pulmonary tuberculosis from the medical point of view. He states that pneumothorax is indicated when rather than exsultive lesion, with or without cavity formation, in one lung, the contralateral lung is entirely sound or contains only a fibrotic and quiescent lesion, and the side from which the bleed ing causing produce hemoptysis is definitely ascer tainable.

Five operations performed to obtain pulmonary collapse are: (1) phrenectomy (2) phrenectomy plus scalenotomy (3) external pneumolysis or apicectomy, (4) ternal pneumolysis, and (5) extrapleural thoracoplasty.

The beneficial effects of phrenectomy are partial compression of the lung, relief of the tension on pleural adhesions, and the prevention of up and down movement of the lung. Partial compression varies enormously. The diaphragm may not rise 1 cm. or may rise 5 cm. or more. Exceptionally pleural adhesions become slack as a result of the rise in the diaphragm and cavities previously held open on the affected side place the lung in rest. Experience also shows that phrenectomy is beneficial in disease of the upper lobe as well as disease of the lower lobe.

In cases with pleural cavities, phrenectomy with scalenotomy will often give better results than

phrenectomy alone. The cutting of the muscle bellies of the three scalen allows the four upper ribs to drop, and as the action of the intercostal muscles on the four upper ribs is dependent upon flexion of the first rib by the scalen, it greatly reduces movement at the apex of the lung.

External pneumolysis or plicolysis has never found much favor in America. The author describes the operation briefly.

Internal pneumolysis is done in cases in which adhesions prevent collapse by the injection of air through a thoracoscope, adhesions are studied and localized and then are cut with an electrocautery unit. This is a highly specialized procedure. Of 35 reported cases, internal pneumolysis rendered an unsatisfactory collapse satisfactory in 75 per cent.

In general, thoracoplasty is limited to cases of moderately or far advanced chronic tuberculosis, with or without hemoptysis, in which the lesions are of the fibro-calcific type, with or without cavity formation or empyema, and confined principally to one lung, the general condition, heart, and resistance to tuberculosis are fairly good, and, and resistance to including a sufficiently long antituberculous regime and attempts to induce artificial pneumothorax have failed.

In conclusion the author states that surgical measures are not intended to take the place of the older methods of treating tuberculosis. They are merely supplementary. Their purpose is immobilization of the diseased lung. Before surgery is undertaken, bed rest should be tried.

JOSE J. MALOZZI, M.D.  
Brunn, H. Lung Abscess. *J Am Med Ass* 1934, 93: 999

The author discusses various methods of treating lung abscess and reviews the end results in 305 cases treated in the period from 1915 to 1934.

He states that postural drainage is not as valuable in lung abscess as in bronchiectasis. In the cases of patients who are ill it is sometimes dangerous as the recumbent position renders expectoration more difficult and reduces the chest volume. Unless the abscess has broken into a bronchus, postural drainage is useless.

Bronchocopy is unsatisfactory as a method of treating lung abscess.

Artificial pneumothorax tends to break down protective adhesions and may favor rupture of the abscess into the extrapleural space with the resulting development of empyema.

Phrenic palsy and anapnoea treatment are unsatisfactory.

X-ray treatment may prove to be a valuable adjunct.

For diagnosis, Brunn considers X-ray examination most important. He places little reliance on physical diagnosis, but states that in the interpretation of the roentgenogram the surgeon must be guided by the findings of physical examination.

Because of the predominantly anaerobic nature of the organisms present in lung abscess, aeration of the abscess by wide surgical opening is imperative. Operation should be performed in 2 stages, the first stage consisting of attachment of the visceral pleura to the chest wall. In 32 cases in which a 1-stage thoracotomy was done the mortality was 64 per cent, whereas in 28 cases in which thoracotomy was done in 2 stages the mortality was 32 per cent.

Of the total series of 205 cases reviewed, 133 were treated medically and 72 surgically. Of the patients treated medically, 63 were benefited. Of those treated surgically, 40 were benefited and 32 died.

Prolonged medical treatment previous to operation is apparently of no advantage.

G DANIEL DELPEAT, M D

#### Edwards, A T Malignant Disease of the Lung *J Thoracic Surg*, 1934, 4 107

Edwards reports on seventy-three cases of carcinoma of the lung. Fifty-three of the patients were men. Forty-eight were between forty and sixty years of age. The oldest patient was sixty-nine and the youngest twenty-six years of age. The right side was involved in thirty-three cases, the left side in forty, the left lower lobe in twenty-six, the right lower lobe in twenty, the left upper lobe in fourteen, the right upper lobe in six, the right middle lobe in five, and the right hilar region in two.

Among the important symptoms were cough, the expectoration of sputum which generally was of a mucoid frothy type but occasionally was definitely purulent, hæmoptysis varying from slight staining to brisk hæmorrhage, dyspnoea, and pain varying from occasional discomfort to intense neuritis.

The clinical signs were generally those of bronchial obstruction causing atelectasis of the involved lobe. In the later stages there was secondary pleural effusion. Loss of voice or hoarseness or the appearance of Horner's syndrome suggested the presence of the disease in the mediastinal glands. Clubbing of the fingers and toes was not uncommon.

Roentgenography, bronchography with lipiodol, and bronchoscopy were of the greatest aid in the diagnosis.

The treatment consisted of radical operation or the implantation of radon seeds. The author designed special containers for the radon. These had a lumen for the passage of air and fluid when the containers were impacted within the bronchus.

The end results were poor, especially when the diagnosis was made late. However, in a fair proportion of the cases the treatment resulted in definite relief and prolongation of life, and the author believes that in a small proportion there is a chance of cure.

J DANIEL WILLEMS, M D

#### Fariñas, P L Serial Bronchography in the Early Diagnosis of Bronchial Carcinoma *Am J Roentgenol*, 1934, 32 757

Serial bronchography permits a diagnosis of bronchial carcinoma in its early stages and therefore

should be used in all cases in which bronchogenic carcinoma is suspected from the clinical picture.

The roentgenological signs of bronchial carcinoma depend upon the type of the tumor. The polypoid type causes a filling defect which, when observed in profile, has the appearance of a notch in the bronchial contour. The infiltrating type produces concentric stenosis which generally occupies a considerable portion of a large bronchus and extends along its branches. The necrotic type produces irregular bronchial cavities with diffuse borders. When the tumor is located near the large bronchi it may compress or displace them. When it is more peripheral it displaces the bronchioles or the parenchyma.

The negative shadows, the notches, the concentric stenosis, and the irregular bronchial cavities with diffuse borders (produced by destruction of the bronchial walls) are signs of bronchogenic carcinoma in its early stages.

J DANIEL WILLEMS, M D

#### Geschickter, C F, and Denison, R Primary Carcinoma of the Lung *Am J Cancer*, 1934, 22 854

Reports in the literature on cancer of the lung emphasize the increasing incidence of the disease, its frequent occurrence in young persons, and the importance of bronchoscopy in early diagnosis. The disease runs a rapidly fatal course with early and widespread metastasis to other organs. Untreated patients rarely survive the diagnosis by more than six months.

The more common form, which usually occurs after middle age, is the hilar cancer composed of epidermoid cells resembling the lining cells of the large bronchi. The less common form is a diffusely growing adenocarcinoma which usually occurs earlier in life.

Cancer of the lung is more common in males than in females. Irritants causing chronic inflammation are believed to be predisposing factors.

The disease may be present for some time without causing symptoms. The first sign is usually a dry, non-productive cough. The expectoration of blood-tinged sputum and of tumor tissue, pain, and clubbing of the fingers and toes are late manifestations.

The physical findings vary with the size and location of the tumor. As a rule physical examination discloses localized dullness, increased breath sounds, and diminished tactile fremitus. A cough of insidious onset, wheezing respiration, and dyspnoea out of proportion to the physical findings are important clinical features. In some cases the earliest signs and symptoms may be due to metastases.

The authors review 60 cases in which the diagnosis was confirmed by microscopic examination and the distribution of the tumor determined by roentgenography or autopsy. Eighteen of the neoplasms could be readily classified as adenocarcinomata and 34 as cancers of the epidermoid type. The rest could not be classified satisfactorily. In typical cases of hilar carcinoma the roentgenogram

was followed by vomiting, weakness, and rise in the temperature to 103 degrees F. The patient developed granulocytopenia. She had been given *alibazol* and *pyrimidin*. After several doses of pentnucleotide and a blood transfusion she recovered. Later X-ray treatments given at longer intervals and in smaller doses were well borne.

The pathological diagnosis of the lung tumor was carcinoma of the lung, Grade 2.

The patient was discharged in fair condition on April 20, 1934.

I conclude the author calls attention to the difficulty in diagnosing a primary tumor early; the importance of the proper interpretation of early symptoms; the difficulty of interpreting early roentgenograms; and the comparative ease with which lobectomy may be performed successfully in suitable cases.

J. LOWE KASPERSON, M.D.

Overholt, R. H. The Total Removal of the Right Lung for Carcinoma. *J. Thorac Surg.* 1934, 4, 90.

The author reports the first case of removal of the entire right lung for malignancy. Removal of the entire left lung for malignancy has already been reported in the literature. In the author's case, bronchoscopic biopsy was negative for malignancy whereas the clinical and X-ray evidence was strongly positive.

Following the preliminary induction of pneumothorax, the operation was performed under anesthesia induced with an intratracheal tube and a closed circuit. Cyclopropane gas anesthesia was chosen because it can be induced with concentrations as low as from 5 to 15 per cent and therefore permits the administration of from 85 to 95 per cent of oxygen during the course of the surgical anesthesia. While the surgeon was working on the root of the lung, the anesthetist purposely caused cessation of respiration. Apnea was induced by over oxygenation until respiratory movements stopped. Gentle and infrequent inflation and deflation of the left lung was carried out artificially by manipulating the bag on the closed-circuit rebreathing apparatus. The apnea was maintained for forty-five minutes and greatly facilitated the work on the lung root.

The lung was removed in one stage and the chest closed without immediate thoracoplasty. This procedure is of advantage because the pathological condition is removed immediately and, with closed and rigid thorax, pressure against the heart and mediastinum can be controlled. Thoracoplasty was performed later.

EARL O. LATIMER, M.D.

#### ESOPHAGUS AND MEDIASTINUM

Ochsner A., and Owen, N. Anterothermic Esophagoplasty for Impermeable Stricture of the Esophagus. *J. Surg.* 1934, 40, 1055.

The first attempt at anterothermic esophagoplasty was made by Bircher in 1861, and the first successful anterothermic esophagoplasty was performed in

1907 by Roux. The authors have analyzed the reports of 240 cases in which an anterothermic esophagoplasty was attempted for strictures of the esophagus. In these cases 243 operations were performed. Dermato-esophagoplasty was done in 13.4 per cent; jejuno-esophagoplasty in 14.8 per cent; jejuno-dermato-esophagoplasty in 41.3 per cent; colo-esophagoplasty in 8 per cent; salpingo-gastro-esophagoplasty in 9.9 per cent; gastro-esophagoplasty in 9.2 per cent; and a miscellaneous and incomplete series of operations in 3.3 per cent.

In dermato-esophagoplasty the new esophagus is formed entirely from the skin of the anterior thorax, the cutaneous tube being used to connect the cervical esophagus and the stomach. The intraperitoneal manipulation is minimal and the entire skin tube can be made in 3 stages. A disadvantage is the danger of digestion of the skin tube by the gastric contents at the point of anastomosis between the skin tube and the stomach. The operation was completed in 53 per cent of the cases in which it was tried. Of the cases in which it was completed, the results were good or fair in 73.6 per cent.

In jejuno-esophagoplasty the new esophagus is formed from a loop of jejunum which is mobilized anterior to the thorax and beneath the skin of the anterior thorax. A theoretical advantage of this type of operation is that the gut retains its peristaltic activity. A decided disadvantage, however, is the danger of interference with the blood supply of a loop long enough to extend from the cervical region to the stomach. The operation was completed in 43.3 per cent of the cases in which it was attempted. A frequent complication was gangrene of the mobilized loop.

Jejuno-dermato-esophagoplasty consists in the formation of a skin tube for portion of the newly formed esophagus and the use of a mobilized loop of jejunum for the remaining portion. The advantage of this technique is that the jejunum is better able to withstand the digestive action of the stomach than the skin tube, and when a skin tube is used for the upper portion interference with the blood supply of the jejunal loop is less apt to occur. The operation was completed in 65.3 per cent of the cases in which it was tried, and the results were classified as good in 97.8 per cent of the cases in which it was completed. The authors believe that this is the procedure of choice although it requires a large number of operations. The average number in the cases reviewed was 4.3 whereas the average number in the cases in which jejuno-esophagoplasty was done was 3.2.

In colo-esophagoplasty a loop of the colon is used to bridge the distance between the cervical esophagus and the stomach. This operation was done in a relatively small group of the reviewed cases, but was completed in 60 per cent. Fair to excellent results were obtained in 90 per cent of the cases in which it was completed.

In salpingo-gastro-esophagoplasty the new esophagus is formed by a tube formed from the stomach. A disadvantage of this procedure is the danger of

digestion of the skin tube by the gastric secretions in the cases in which a tube of skin is used. Of the cases in which the operation was attempted it was completed in only 10 per cent.

Gastro-oesophagoplasty consists in mobilizing the entire stomach anterior to the thorax and anastomosing it to the cervical oesophagus. It has the advantage that it can usually be done in 1 or 2 stages, but the disadvantage that it is a formidable procedure. Of the cases in which it was attempted it was completed in 45.4 per cent. Function was good in 60 per cent of the cases in which it was completed.

The mortality rate in the entire series of cases was 32.6 per cent. The mortality was highest in the cases in which the entire stomach or a long loop of bowel was used in the reconstruction of the oesophagus—66.3 per cent and 46.6 per cent, respectively. It was lowest in the cases in which the oesophagus was formed from the colon or by a combination of small bowel and skin tube—22.2 per cent and 22.7 per cent, respectively. The percentage of completed operations was highest—65.3—in the cases in which jejunodermato oesophagoplasty was done, and next highest—63.3—in the cases of dermato-oesophagoplasty in which only skin was used to construct the new oesophagus.

It was lowest—8.3—in the cases in which a tube was formed from the stomach.

The authors report a case of their own in which a jejunodermato-oesophagoplasty was done for an impermeable lye stricture in a child ten years of age. The patient had had a gastrostomy since the age of four. In the first stage of the operation a loop of jejunum was mobilized, the distal end connected with the stomach, and the proximal end brought up to the lower portion of the thorax to lie subcutaneously anterior to the sternum. The second stage consisted of the formation of a skin tube from the skin of the anterior surface of the thorax. In the third stage the cervical oesophagus was mobilized, and the oesophagus was divided just above the stricture. The distal end closed blindly, and the proximal end brought up into the wound and anastomosed to the previously formed skin tube. Fistulae developed at both ends of the skin tube, but following repeated operations were successfully closed.

On the basis of their experience in this case the authors recommend the use of a flap at the lower end of the skin tube to decrease the danger of fistula formation at the lower end, and invagination of the cervical oesophagus into the skin tube to prevent infection of the anastomosis of the oesophagus to the skin tube.

Souttar, H. S. Cancer of the Oesophagus. *Brit. M. J.*, 1934, 2, 797.

It is only rarely that radical removal of a carcinoma of the oesophagus can be considered, and in spite of a few brilliant results, it seems most unlikely, on the basis of the pathological factors, that radical surgery can ever become a practical method. The depth at which the oesophagus lies, the fragile nature

of its wall (which possesses neither a submucous nor a peritoneal coat), the complexity of the structures by which it is surrounded, and the age at which carcinoma of the oesophagus occurs are all opposed to a direct attack. Therefore relief of the dysphagia may be sufficient cause for gratitude.

For relief of the dysphagia we have 3 methods at our disposal: dilatation, intubation, and gastrostomy. The use of gastrostomy is, of course, a confession of surgical failure. If gastrostomy is to be performed, it should be done before exhaustion has increased its dangers and decreased its value. Dilatation should be attempted only under the direct control of the oesophagoscope. The dysphagia is usually relieved immediately by this procedure, but is likely to recur in a few weeks. To prevent its recurrence the author devised some years ago a flexible tube formed of a spiral of German silver wire which has an expanded upper end and a twisted oval section to prevent its upward displacement. This tube is now in general use. On account of its extreme flexibility, it is readily tolerated. The patient is usually quite unconscious of its presence, and its large lumen allows the passage of ordinary food. With reasonable care in the preparation and mastication of the food, the tube should not become blocked. The slight difficulty experienced at first in the introduction of the tube has been overcome by the author by a very simple device. It was found that even after full dilatation the lower edge of the tube had a tendency to catch on the end of the growth and would not pass through the lumen. This can be entirely avoided if, before the introduction of the tube, a small cone of gelatin is inserted into its end. A glycerin suppository of suitable size will answer the purpose perfectly. The facility of the introduction of the tube produced by this simple device is very remarkable. The gelatin dissolves in a few minutes and passes down the oesophagus.

The author's experience with the described methods now extends over about fifteen years and includes more than 300 cases. These methods aim solely at relief of the dysphagia and not at cure of the disease.

At present it appears that cure can be hoped for only from some form of irradiation. For irradiation we have at our disposal radium and the X-rays. When intubation with the author's spiral tube can be effected, this tube may be used very conveniently as a support for radium. A narrow gold tube about 6 in. long is filled with radon gas, its ends are sealed, and one end of the tube is wound into a circle  $\frac{1}{2}$  in. in diameter to form a ring to which a thread can be attached. This tube is lowered into the spiral tube, the ring resting on its upper aperture. The emanation tube does not interfere with the passage of liquids through the intubation spiral and is easily withdrawn at the end of forty-eight hours.

A method which the author has used extensively is the introduction of seeds by means of the oesophagoscope into the substance of the growth itself. It might seem that this procedure is essentially

## INTERNATIONAL ABSTRACT OF SURGERY

shows a solitary mass, usually to the right and overlapping the mediastinal shadow. In typical cases of lobular carcinoma, multiple masses are seen in several lobes of one or both lungs.

Neither surgery nor irradiation has proved very successful in the treatment of lung cancer. However, in a study of 120 cases, Chandler and Potter found the duration of life to be five months longer in cases treated by irradiation than in those not so treated. Exclusion has been accomplished successfully in recent years, but none of the patients subjected to the operation has been followed for five years.

WILLIAM E. SEACRESTON M D

Jackson, C. L., and Kosszmann F W. Bronchial Carcinoma. *J Thorac Surg* 934.4 65

The authors review thirty two cases of bronchopulmonary cancer in which the diagnosis was confirmed by bronchoscopic biopsy. They emphasize the importance of bronchoscopy as a diagnostic procedure in conjunction with X-ray study. They state that bronchoscopic examination is definitely indicated in cases with evidence of bronchial obstruction. It is of the utmost importance in the early diagnosis and accurate localization of neoplasms and as guide for radical surgical procedures. It has become almost a routine procedure in several of the larger clinics in America and is widely used abroad in the examination of patients with cough and expectoration or hemoptysis when the usual procedures fail to reveal the presence of a bronchial lesion. In describing the technique of biopsy the authors state that before biopsy is done a careful study of the bronchoscopic picture should be made and the degree of any distortion, fixation, and infiltration of the bronchial wall should be noted. The tissue for examination must be obtained from the growth itself and not from the inflammatory end-zone or granulations. Care should be taken to prevent trauma to normal bronchial spurs and to avoid biting too deeply into the tissue. If the bronchial wall shows no definite involvement or only slight bulging, biopsy should be postponed.

The authors discuss the classification of bronchogenic neoplasms on the basis of the type of cell. Of the thirty-two lesions in the cases reviewed, four were adenocarcinoma, seven, squamous-cell carcinoma, eight, carcinoma of cell type difficult to establish, six, combined squamous cell carcinoma and adenocarcinoma, four, diffuse small round-cell or so-called medullary carcinomas, four, carcinoma similar to the last mentioned group but with cells presenting more corded or tubular appearance and three, metastatic carcinomas.

The authors state that in the grading of bronchogenic neoplasms the clinical and roentgenographic findings must be taken into account. The prognosis in the cases reviewed was grave. The data, none of the patients has lived longer than eighteen months after the appearance of symptoms.

The history and the X-ray bronchoscopic and biopsy findings in each of the thirty-two cases

reviewed are reported. The article is profusely illustrated with photomicrographs of some of the tumors and drawings showing the bronchoscopic appearance several of which is in color.

J V ELLIOTT THORNTON M D

Titte, W. McC., and Womack, N. A. Bronchogenic Carcinoma. A Classification in Relation to Treatment and Prognosis. *J Thorac Surg* 934.4 5

Most, if not all, primary carcinomas of the lung are of bronchogenic origin, arising from the bronchial epithelium. These tumors are classified by the authors into (1) those arising in a major bronchus, and (2) those arising in minor bronchus or the lung parenchyma.

They are classified further on the basis of differentiation. Tumors of Grade 1 are those in which most of the cells tend to resemble adult ciliated cells or goblet cells or form definite squamous epithelium. Those of Grade 2 are tumors in which for the most part show a tendency toward differentiation, but the cells of which are not quite so mature. Of Grade 3 are tumors made up of cells which to large extent resemble those of the basal epithelial layer.

In the review of cases, the length of time elapsing between the onset of the symptoms and death averaged twenty-two and six-tenths months in cases of tumors of Grade 1, sixteen months in cases of tumors of Grade 2, and five and eight tenths months in cases of Grade 3.

Most of the lesions of Grade 1 were located in the major bronchi, and most of the less differentiated lesions in the smaller bronchi or the periphery of the lung.

As compared with tumors of the minor bronchi and the periphery of the lung, tumors of the major bronchi produce symptoms earlier, extend more slowly, are diagnosed more easily (especially by biopsy through the bronchoscope) and are more amenable to surgery.

J D VAN WILKIN, M D

Rabin, C. W., and Neuhof, H. A Topographic Classification of Primary Cancer of the Lung. Its Application to the Operative Indication and Treatment. *J Thorac Surg* 934.4 147

Because of the fact that at the present time interest in cancer of the lung seems to be centered on the advisability of surgical removal, the authors are led to suggest a new classification of cancers of the lung based on gross topography and distribution which they have found of aid in determining operability. From a study of on cases among primary carcinomas they conclude that, in general, bronchopulmonary carcinomas can be divided into two groups with very few borderline cases. The classification they suggest is as follows:

1. Circumscribed cancers (usually operable)

A. Parenchymal (per cent of the total number) X-ray examination shows peripheral well-demarcated growths in the substance of the lung, some of which

may involve nearly a whole lobe. In cases of large tumors, bronchoscopy may reveal compression of the bronchi. There are usually no symptoms except those referable to the local increase in the size of the neoplasm. Regional lymph-node involvement occurs late and is limited.

- B. Peripheral (12 per cent of the total number) X-ray examination shows a well-demarcated shadow at the surface of the lung, which widens at the chest wall. Bronchoscopy is usually negative. The symptoms include local or referred chest pain. Regional lymph-node involvement occurs late and is limited.
2. Non circumscribed, infiltrating cancers (usually inoperable)
  - A. Main bronchus, non stenosing and stenosing forms (63 per cent of the total number) X-ray examination may be negative or reveal root infiltration, atelectasis, infection of the lung or pleura, or metastatic lesions. Pleural effusion is frequent and may occur early. Bronchoscopy is positive. The symptoms are cough, hæmoptysis, infection, atelectasis, or metastases. Regional lymph-node involvement occurs early.
  - B. Branch bronchus (13 per cent of the total number) X-ray examination may be negative, reveal the picture of unresolved pneumonia, or disclose evidence of metastases. Pleural effusion may be present. Bronchoscopy is usually positive. The symptoms are usually those of metastases. Regional lymph-node involvement occurs early.

At the Mt. Sinai Hospital, New York, more than 250 cases of bronchopulmonary carcinoma have been studied according to this classification during the last ten years.

The article includes photomicrographs, photographs of gross specimens, roentgenograms, a brief discussion of 5 cases in which operation was done for the removal of a primary cancer of the lung, and an outline of the indications for operation based on the topographic classification.

JAY EUGENE TREMAINE, M D

Eggers, C. Lobectomy for Carcinoma of the Lung  
*J Thoracic Surg*, 1934, 4 211

Progress in the treatment of malignant tumors of the lung has not kept pace with general progress in thoracic surgery mainly because the early diagnosis of malignant tumors of the lung is still difficult. There is much to be learned concerning the onset of malignant tumors of the lungs and bronchi, their progress, their invasive qualities, their pathological character, and their radiosensitivity.

The safety of lobectomy and pneumonectomy depends on early diagnosis made before the primary

growth has become attached to or has involved the surrounding organs and before the main bronchus has become involved.

A case of carcinoma of the lung in which lobectomy was performed is reported in detail. The patient was a woman forty-five years of age who was admitted to the hospital January 3, 1934, complaining of pain in the left chest, bloody sputum, dyspnoea, and night sweats. The findings of physical examination suggested a pleural effusion, while the history indicated a lesion within the left lung. After two aspirations each of 1,100 c.cm. of clear straw-colored fluid followed by the injection of air, X-ray examination showed the left lower lobe nearly collapsed. The upper lobe was prevented from collapse by dense bands of adhesions as well as by an intrapulmonary lesion resembling a cavity of a suppurative focus, although the pleural effusion suggested malignancy.

Bronchoscopic examination revealed distortion of the left main bronchus. By this examination it was determined that the lesion was probably malignant although chronic abscess could not be ruled out.

In the absence of positive support from the roentgenographic, bronchoscopic, or laboratory examinations, a clinical diagnosis of probable malignancy of the lung was made on the basis of the gradual onset of the condition with the expectoration of blood, the afebrile course, the increasing dyspnoea, and the pleural effusion.

Under colonic avertin anaesthesia supplemented by nitrous oxide oxygen and ether, an incision was made along almost the entire fifth intercostal space. After some difficulty in freeing the lung the lower lobe was found collapsed and very solid. It was extensively adherent to the upper lobe. The upper lobe contained a hard, nodular visible tumor. On liberation of the lower lobe the tumor tissue was found to extend close to the main bronchus and numerous small tumor implantations were discovered on the lateral chest wall, in the pleura of the lower lobe, and covering the aorta. In spite of this, lobectomy was performed in the hope that the metastases might be controlled by X-ray treatment. An attempt was made to inflate the contracted lower lobe by making multiple incisions in the visceral pleura, but was unsuccessful on account of the thickened condition of the lobe. The chest wall was closed in layers, and closed drainage was maintained through a stab wound in the ninth interspace by a  $\frac{1}{2}$ -in rubber tube, the outer end of which was kept under a fluid level.

The postoperative course was relatively uneventful. A roentgenogram of the chest taken after twenty-four hours showed fairly good lung expansion with no displacement of the mediastinum. The chest wound healed by primary union. The patient was allowed out of bed on the eighteenth day.

X-ray treatment was begun four weeks after the operation, but was discontinued because of a severe reaction. Later it was repeated and was again followed by a severe reaction. The third treatment



## INTERNATIONAL ABSTRACT OF SURGERY

was followed by vomiting, weakness, and a rise in the temperature to 103 degrees F. The patient developed granulocytopenia. She had been given alcohol and pyrimidin. After several doses of pentacetic acid and a blood transfusion she recovered. Later X-ray treatments given at longer intervals and in smaller doses were well borne. The pathological diagnosis of the lung tumor was carcinoma of the lung, Grade 2.

The patient was discharged in fair condition on April 20, 1934.

In conclusion the author calls attention to the difficulty in diagnosing a primary tumor early in the importance of the proper interpretation of early roentgenograms and the comparative ease with which lobectomy may be performed successfully in suitable cases.

J. LOWRY KIRKPATRICK, M.D.

Overholt, R. H. The Total Removal of the Right Lung for Carcinoma. *J. Thoracic Surg.* 1934, 4, 95.

The author reports the first case of removal of the entire right lung for malignancy. Removal of the entire left lung for malignancy has already been reported in the literature. In the author's case, bronchoscopic biopsy was negative for malignancy, whereas the clinical and X-ray evidence was strongly positive.

Following the preliminary induction of pneumothorax, the operation was performed under endotracheal intubation with an intratracheal tube and endotracheal Cyclopropane gas anesthesia was chosen because it can be induced with concentrations as low as from 5 to 5 per cent and therefore permits the administration of from 85 to 95 per cent of oxygen during the course of the surgical anesthesia. While the surgeon was working on the root of the lung, the anesthetist purposely caused cessation of respiration. Apnea was induced by over-Gentle and minimal inflation movements stopped the left lung was carried out artificially by manipulating the bag on the closed circuit rebreathing apparatus. The apnea was maintained for forty-five minutes and greatly facilitated the work on the lung root.

The lung was removed in one stage and the chest closed without immediate thoracoplasty. This procedure is of advantage because the pathological and rigid thorax, pressure against the heart and mediastinum can be controlled. [Thoracoplasty was performed later.]

PAUL O. LATTIMER, M.D.

### ESOPHAGUS AND MEDIASTINUM

Ochsner, A. and Owens, N. Anterotherapeutic Esophagoplasty for Impermeable Stricture of the Esophagus. *Ann. Surg.* 1934, 99, 35.

The first attempt at anterotherapeutic esophagoplasty was made by Burcher in 1891, and the first successful anterotherapeutic esophagoplasty was performed in

1907 by Roux. The authors have analyzed the reports of 240 cases in which an anterotherapeutic esophagoplasty was attempted for strictures of the esophagus. In these cases 243 operations were performed. Dermato-esophagoplasty was done in 34 per cent, jejuno-esophagoplasty in 21 per cent, jejuno-dermato-esophagoplasty in 41.3 per cent, colo-esophagoplasty in 8.3 per cent, salpingo-esophagoplasty in 9.9 per cent, gastro-esophagoplasty in 9.1 per cent, and miscellaneous series of operations in 3.3 per cent.

In dermato-esophagoplasty the new esophagus is formed entirely from the skin of the anterior thorax, the cutaneous tube being used to connect the cervical esophagus and the stomach. The intraperitoneal manipulation is minimal and the entire skin tube can be made in 1 stage. A disadvantage is the danger of digestion of the skin tube by the gastric contents at the point of anastomosis between the skin tube and the stomach. The operation was completed in 33 per cent of the cases in which it was tried. Of the cases in which it was completed, the results were good or fair in 73.6 per cent.

In jejuno-esophagoplasty the new esophagus is formed from a loop of jejunum which is mobilized anterior to the thorax and beneath the skin of the anterior thorax. A theoretical advantage of this type of operation is that the gut retains its peristaltic activity. A decided disadvantage, however, is the danger of interference with the blood supply of a loop long enough to extend from the cervical region to the stomach. The operation was completed in 43.3 per cent of the cases in which it was attempted. A frequent complication was gangrene of the mobilized loop.

In jejuno-dermato-esophagoplasty consists in the formation of a skin tube for a portion of the newly formed esophagus and the use of a mobilized loop of jejunum for the remaining portion. The advantage of this technique is that the jejunum is better able to withstand the digestive action of the stomach than the skin tube and when a skin tube is used for the upper portion interference with the blood supply of the jejunal loop is less apt to occur. The operation was completed in 65.3 per cent of the cases in which it was tried, and the results were classified as good in 97.8 per cent of the cases in which it was completed. The authors believe that this is the procedure of choice although it requires a large number of operations. The average number in the cases reviewed in which jejunum-esophagoplasty was done was 4.3 whereas the average number in the cases in which dermato-esophagoplasty was done was 1.5.

In colo-esophagoplasty a loop of the colon is used to bridge the distance between the cervical esophagus and the stomach. This operation was done in a relatively small group of the reviewed cases, but results were obtained in 90 per cent of the cases in which it was completed.

In salpingo-esophagoplasty the new esophagus is formed by a tube formed from the stomach. A disadvantage of this procedure is the danger of

digestion of the skin tube by the gastric secretions in the cases in which a tube of skin is used. Of the cases in which the operation was attempted it was completed in only 10 per cent.

Gastro-oesophagoplasty consists in mobilizing the entire stomach anterior to the thorax and anastomosing it to the cervical oesophagus. It has the advantage that it can usually be done in 1 or 2 stages, but the disadvantage that it is a formidable procedure. Of the cases in which it was attempted it was completed in 45.4 per cent. Function was good in 60 per cent of the cases in which it was completed.

The mortality rate in the entire series of cases was 32.6 per cent. The mortality was highest in the cases in which the entire stomach or a long loop of bowel was used in the reconstruction of the oesophagus—66.3 per cent and 46.6 per cent, respectively. It was lowest in the cases in which the oesophagus was formed from the colon or by a combination of small bowel and skin tube—22.2 per cent and 22.7 per cent, respectively. The percentage of completed operations was highest—65.3—in the cases in which jejunodermato-oesophagoplasty was done, and next highest—63.3—in the cases of dermato-oesophagoplasty in which only skin was used to construct the new oesophagus.

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The authors report a case of their own in which a jejunodermato-oesophagoplasty was done for an impermeable lye stricture in a child ten years of age. The patient had had a gastrostomy since the age of four. In the first stage of the operation a loop of jejunum was mobilized, the distal end connected with the stomach, and the proximal end brought up to the lower portion of the thorax to lie subcutaneously anterior to the sternum. The second stage consisted of the formation of a skin tube from the skin of the anterior surface of the thorax. In the third stage the cervical oesophagus was mobilized, and the oesophagus was divided just above the stricture. The distal end closed blindly, and the proximal end brought up into the wound and anastomosed to the previously formed skin tube. Fistulae developed at both ends of the skin tube, but following repeated operations were successfully closed.

On the basis of their experience in this case the authors recommend the use of a flap at the lower end of the skin tube to decrease the danger of fistula formation at the lower end, and invagination of the cervical oesophagus into the skin tube to prevent infection of the anastomosis of the oesophagus to the skin tube.

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of its wall (which possesses neither a submucous nor a peritoneal coat), the complexity of the structures by which it is surrounded, and the age at which carcinoma of the oesophagus occurs are all opposed to a direct attack. Therefore relief of the dysphagia may be sufficient cause for gratitude.

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A method which the author has used extensively is the introduction of seeds by means of the oesophagoscope into the substance of the growth itself. It might seem that this procedure is essentially

dangerous since it is impossible to be sure that the seeds will not enter the mediastinum or the surrounding structures. However in well over 100 cases the author never experienced any trouble attributable to this cause. In a few cases a fairly satisfactory result was obtained, the patient recovering the ability to swallow and being restored to a condition of health. In no case, however, was a cure obtained. All of the patients died within a year.

JOSEPH K. NARAT, M.D.

O'Donoghue, L., and Raven, R. W. Surgical Exposure of the Esophagus. *Br. J. Surg.* 934, 363.

The authors carried out a series of dissections to determine the best surgical approaches to the esophagus. Measurements were made of the length of the esophagus and the depth of the organ from the surface at various levels. The technique of each approach is given in detail.

In the approach described by the authors the cervical esophagus lying between the trachea and the vertebral bodies may be exposed for a length of 9 cm. At the level of the upper border of the mass below sternal its depth from the surface is 6 cm.

Five approaches to the thoracic esophagus and the portion of esophagus exposed by each are described. The right transpleural approach to the

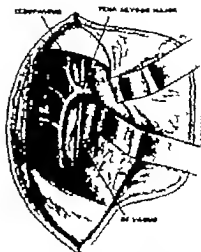


Fig. Exposure of the thoracic esophagus at the bifurcation of the trachea. The parietal pleura has been separated from the vertebral bodies in downward direction. The esophagus is exposed between the separated lung and pleura and the bodies of the vertebrae. The vena azygos major is the important landmark for the esophagus as it crosses behind the latter to join the superior vena cava.

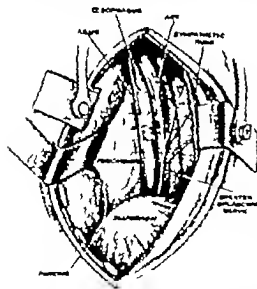


Fig. Exposure of the thoracic esophagus from the arch of the aorta to the diaphragm by the left transpleural approach. The left lung is retracted forward and the esophagus is seen lying between the descending thoracic aorta behind and the pericardium in front. The latter constitutes the greatest obstacle to clear view of the esophagus.

upper esophagus exposes 8.5 cm. of the structure at a depth of 7.5 cm. The right transpleural approach to the lower esophagus exposes 4 cm. of the structure between the lung root and the diaphragm at depth of 1 cm. If the azygos vein is ligated, an additional 2 cm. can be exposed. The left transpleural approach to the lower esophagus exposes 14 cm. of the organ between the arch of the aorta and the diaphragm at depth of 9.5 cm. The right mediastinal approach permits exposure of 8 cm. at a depth of 6.5 cm. and the left mediastinal approach an exposure of about 14 cm. at depth of 7.5 cm.

The abdominal esophagus can be exposed for length of about 5 cm. at depth of 13 cm. by the simple laparotomy method, and for length of about 8 cm. at depth of 14 cm. by a modification of Marshall's method. By mobilization of the organ and retraction of the costal flap it may be brought almost to the surface of the wound.

The authors conclude that the upper esophagus is best approached from the level of the thoracic inlet to the lung root by the right transpleural method, the portion in the region of the lung root, by the right mediastinal route, and the lower esophagus from the level of the aorta to the esophageal hiatus of the diaphragm by the left transpleural route or, if there is doubt as to the upper limit of the lesion, the right transpleural approach. To approach the esophagus from below the modified Marshall's incision is best.

EARL O. LATTIN, M.D.

Poinso, R, Legrand, M, and Paillas, J E Sarcomata of the Mediastinal Glands (Les sarcomes ganglionnaires du médiastin) *Arch méd-chir de l'appar respir*, 1934, 9 369

Sarcomata of the glands of the mediastinum are primary malignant tumors developed either from the reticulum or the leucopoietic tissue of the glands. The authors therefore prefer to call them "sarcomata" rather than "lymphosarcomata" as the latter term indicates tumors developed only from lymphopoietic tissue.

Sarcomata of the glands of the mediastinum generally occur in children or young adults. Their cause is unknown. Many factors indicate that they are of infectious origin. Among these are the temperature, which sometimes rises as high as 39 degrees C, the infectious condition, the rapid development of the tumor, and the blood picture which shows a slight leucocytosis and polynucleosis. The authors describe the histological findings in detail with photomicrographs.

The tumors are classified into pure mediastinal forms, mediastinopulmonary forms, mediastinopleural forms, associated forms, that is, forms asso-

ciated with other diseases such as tuberculosis, abscess of the lung, or bronchiectasis, which are rare, and metastatic forms. Typical cases of the principal forms are reported by the authors with roentgenograms.

The condition is fatal. The average duration of life is about ten months. Sometimes death results in a few weeks. The longest survival was three years. In the pure forms long remissions can be brought about by penetrating roentgen therapy. The doses should be large enough to cause death of the pathological cells without producing necrosis of the normal tissue. The dosage necessary in the individual case will depend upon the effect on the tumor. The irradiation of the whole tumor should be homogeneous and the dosage so distributed in time as to prevent local and general accidents from too intense irradiation. The cross fire method from several portals of entry should be used to ensure homogeneity.

Surgical operation is generally impossible because the tumors are adherent and infiltrating. Median sternotomy may be done as a palliative measure for decompression but any operation is serious in these cases.

AUDREY GOSS MORGAN, M D

# SURGERY OF THE ABDOMEN

## ABDOMINAL WALL AND PERITONEUM

Catterina, A.: The Bassini Operation and the Brenner-Hackenbruch-Draener and Kirschner Operations (Die Bassinische Operation und die Operationen nach Brenner Hackenbruch-Draener und Kirschner) *Zentralbl f Chir* 934, p. 933.

Catterina again enthusiastically recommends the Bassini operation. He attributes poor results as regards recurrences to a poor technique and to the fact that beginners undertake the operation. In his cases the incidence of recurrence is only between 1 and 10 per cent. Poor results are explained also by the fact that in German textbooks the technique of the Bassini operation is often not described in sufficient detail or described incorrectly. It is described best in Kirschner's book.

The fundamental aim of the Bassini operation is restoration of the inguinal canal from the anatomical and physiological standpoints. There are two openings, one abdominal and one subcutaneous, and two intra-abdominal pressures forces the spermatic cord. The posterior wall of the internal oblique muscle, the transversalis muscle, and the transversalis fascia, which approach the posterior free border of Pott's ligament. Catterina incises the transversalis fascia, separates the triple layer from the preperitoneal fatty tissue and from the psoas muscle. The internal oblique muscle lying in front of it, and, to strengthen the weakest inner point, includes the outer border of the rectus muscle in the first two stitches of the deep row of sutures. The well-known high position of the internal oblique muscle never causes difficulties as even in cases of large hernia the internal oblique muscle drops down after removal of the herniated coil.

In the Brenner operation the cremaster muscle is the chief factor as it is sutured to the lower border of the internal oblique muscle and outer border of the rectus and therefore, especially in cases of high position of the internal oblique muscle covers the weak spot like an apron. Catterina claims, however, that its object is not accomplished as the cremaster muscle has no relation to Poupert's ligament. It is related only to the testicle. Even though it is sometimes hypertrophic, it is usually very thin. Moreover it is injured when it is separated from the spermatic cord. Unlike the posterior Bassini wall, it does not meet physiological requirements. When the results of the Brenner operation are not poor, they depend, not upon the cremaster, but upon reduplication of the aponeurosis of the external oblique muscle.

In the Hackenbruch-Draener operation a deep Bassini suture is not made. The spermatic cord is placed between the leaves of the aponeurosis. These leaves offer less resistance to the intra-abdominal pressure than the posterior Bassini wall. The primary lead to disturbances in the psoas may easily lead to disturbances in the spermatic cord bundles by the constriction of the muscle trophism and it is a fact that Bassini drew his suture so tight that they offered resistance to artificial pressure at the time of the operation. However Bülow and Gossenshafer taught that at the site where the contractile substance of the muscle fibers is constricted by sutures it is split off so that only the connective tissue sarcolemma sheaths are attached to Poupert's ligament, while the muscle substance lies in the immediate vicinity is preserved. Draener believes that the separation of the psoas from their bed, which was considered injurious by Flanz, is harmless because the nutrient circulation is restored after their replacement. He rejects sharp separation of the hernial sac because of its danger. Moreover, he regards the removal of the cremaster muscle which Bassini demanded, as useless.

Schmieden performed the Bassini operation, but made now internal inguinal ring by boring through the internal oblique muscle. This favors the formation of connective tissue adhesions and disturbances in the spermatic cord. Schmieden claimed that in the Bassini operation the spermatic cord becomes angulated because the position of the internal inguinal ring is changed first by the tension and the high ablation of the hernial sac and then by the eight sutures in the posterior wall by which the sac ring is displaced upward and outward. In the Schmieden operation this angulation does not occur and only from three to five deep sutures are applied and these do not penetrate the three fold layer.

In the Kirschner operation the cremaster is not removed and the spermatic cord is placed subcutaneously after it has been allowed to make angular twists. The spermatic cord is therefore exposed to severe injury. In Catterina's opinion Kirschner's modification is the best, but is not necessary.

(FRANK) LOUIS NEWELL, M.D.

Gundel H., and Rosenbrich, F. Results of Further Clinical and Microbiological Studies of Peritonitis and Its Prevention and Treatment. *Arch. f. Klin. u. Exp. Chir.* (Kriegsbeob.) weitere klinische und bakteriologische Untersuchungen über die Peritonitis und ihre Seroprophylaxe und -therapie. *Die Wochenschr.* 1934, 15.

In appendicitis, the principal exciting organisms are enterococci and anahemolytic streptococci, where-

as in appendiceal abscess and in peritonitis following appendicitis they are fecal bacteria, chief of which are the bacillus coli and the gas gangrene bacillus. The latter apparently acts only through its toxins. However, in all cases of peritonitis, regardless of the site of origin of the condition, there is a mixed infection in which colon bacilli, enterococci, and gas gangrene bacilli are by far the most numerous organisms. Therefore a polyvalent serum is necessary.

In the studies reported the following four types of serum were used: (1) a serum against the gas-gangrene bacillus, the colon bacillus, and enterococci, (2) a serum against the colon bacillus and enterococci, (3) a serum against the colon bacillus, and (4) a serum against enterococci. The investigators were not informed of the composition of a serum until its effect had been determined. The deaths which occurred when inappropriate serum was used indicate the necessity for a use of a triple serum. Among the cases studied there were six of progressing enterococcus peritonitis in which a serum against the colon bacillus or gas gangrene bacillus alone or the old polyvalent peritonitis serum would have been of no value.

The new polyvalent serum has a 65 per cent content of antitoxic colon bacillus serum and a 25 per cent content of enterococcus serum, and contains 10,000 Behring units of a potent gas bacillus antitoxin in 20 c cm. This is the serum of choice for all cases of peritonitis at the time of operation.

To date, 240 cases of peritonitis have been treated with peritonitis serum and studied bacteriologically. There were 27 deaths, a mortality of 11.2 per cent. In addition, 51 patients were given the new polyvalent serum either for treatment or for prophylaxis. During operation, smears were made from the serosal suture of gastric anastomoses as well as from various peritoneal sutures. Pathogenic bacteria were found in 13 (25 per cent). Of 13 patients given prophylactic treatment, 2 died of causes other than peritonitis. Of the 51 patients given the serum for prophylaxis or treatment, 6 died, but 5 of the 6 succumbed to lung and heart complications.

Such found that infection is present in 0.71 per cent of exploratory laparotomies. The new serum should be used to prevent peritonitis from the penetration of bacteria through the intestinal walls. At the end of the operation, while the patient is still under anesthesia, 20 c cm in from 500 to 1,000 c cm of a 5 per cent dextrose solution should be injected intravenously. For the treatment of peritonitis, the serum is given intraperitoneally.

(FRANZ) JACOB E. KLEIN, M.D.

Mauro, M. An Anatomicopathological and Clinical Contribution to the Study of Primary Tumors of the Mesentery (Contributo anatomicopatologico e clinico allo studio dei tumori primitivi del meso). *Arch. ital. di chir.*, 1934, 38, 161.

Mauro reports three mesenteric tumors, discusses such neoplasms with special reference to fibromata, and tries to establish a characteristic syndrome for

growths in the gastrohepatic ligament. He states that only about 350 primary tumors of the mesentery have been reported and some of them are doubtful. Sixty-five per cent of those reported were situated in the mesentery proper, usually that of the ileum, 25 per cent in the great omentum, 2.5 per cent in the gastrohepatic omentum, 0.3 per cent each in the gastrosplenic ligament, the falciform ligament, and the mesentery of the duodenojejunal angle, 0.75 per cent near the ileocecal junction, 1.8 per cent in the mesocolon, and 1.5 per cent each in the mesosigmoid and mesocæcum.

The three tumors reported by the author were a lipoma, a cylindrical celled carcinoma, and a pure fibroma.

The lipoma was a retroperitoneal tumor weighing 6 kgm. which occurred in a man fifty-four years of age. It had pushed forward between the layers of the mesocolon at the hepatic angle. Two special features of this case were an eosinophilia of 80 per cent and an intra-abdominal fremitus which were unexplained and gave rise to the diagnosis of echinococcus cyst. In a review of the literature the author found no mention of these signs in cases of intra-abdominal lipoma.

The cylindrical-celled carcinoma occurred in the mesentery of the ascending colon of a man forty-six years of age. It was the size of a lemon. Mauro believes it originated from aberrant germs of the primitive intestine.

The pure fibroma occurred in the gastrohepatic omentum of a woman twenty-nine years of age who, four years previously, discovered a small painless lump under the left costal margin. During the past year the tumor has grown rapidly and the patient had suffered from gastric disturbances, substernal oppression, and occasional dysphagia. Two months before operation she had a crisis of epigastric pain accompanied by profuse hæmatemesis. At operation, a fibroma weighing 2.5 kgm. and measuring 23 by 20 by 18 cm. was found crowding down the lesser curvature of the stomach. The gastric cavity communicated with a zone of softening and ulceration, the size of an egg, within the tumor. The tumor, together with the lesser curvature, was removed with difficulty on account of the adhesions and vascularity. The patient made an excellent recovery. Mauro ascribes the operative success to the ample exposure by a left paramedian incision and resection of the left costochondral arch by Meyer's method which yields complete control of the entire left hypochondrium.

He states that only 50 cases of unmixed fibroma of the mesentery have been reported. Some of these growths arise from the fibrinous coat of the intestine, a fact of practical importance as it may lead the surgeon to believe that he is dealing with a sarcoma.

Two forms of mesenteric fibromata can be distinguished: one latent and the other causing digestive symptoms. The symptoms of the latter are extremely varied and not characteristic. The final stage is dominated by intestinal obstruction. The

diagnosis is very difficult, if not impossible. The prognosis is always grave because by the time operation is undertaken the tumor is usually voluminous or has produced such disturbances that the patient's general condition is poor.

Including the author's case, only 8 tumors of the gastrohepatic ligament (3 of them fibromata) have been reported. On the basis of these cases Mauro tries to reconstruct the syndrome of a tumor in this location. He states that in its anteroposterior and vertical growth the tumor pushes against the gastric wall, lifts the left hepatic lobe upward, and encroaches on the lesser curvature of the stomach which is thereby elongated and displaced downward and to the left while the stomach as a whole remains anchored at the cardia and pylorus. In its lateral growth the tumor may compress the hepatic artery, portal vein, and bile ducts, although in none of the reported cases was there jaundice, ascites, or any hepatic disturbance. The cardia and adjacent part against the pillars of the diaphragm, with resulting secondary megacystophagus, as in the author's case. This is the first report of this particular pathogenesis of megacystophagus. Mauro believes that the pushing of the epicardial portion of the esophagus against the diaphragm is a pathognomonic sign of tumor in the small omentum.

With regard to the diagnosis, Mauro says that, on account of its rarity, the lesion is not thought of and has never been recognized before operation. The usual diagnosis is tumor or cyst of the liver. In fact, there is no unequivocal differentiation between the syndromes.

The article is supplemented by roentgenograms and a bibliography.

M. E. MORGAN, M.D.

## GASTRO-INTESTINAL TRACT

Rammstedt, G. The Operative Treatment of Hypertrophic Stenosis of the Pylorus in Infants. (Die operative Behandlung der hypertrophischen Pylorusstenose der Säuglinge.) *Ergebn. d. Chir.* 934, 7-14.

Rammstedt precedes his discussion of the operative treatment of hypertrophic pyloric stenosis in infants by a discussion of the regional and racial incidence, the clinical picture and symptoms, and the pathological anatomy, the etiology the diagnosis, and the prognosis of the condition.

In the diagnosis he attaches little importance to the demonstration of a tumor as this is very unreliable. He states that at least the differentiation between pure spasm and hypertrophic pyloric stenosis should not be based upon it. On the other hand, he values X-ray examination, especially the technique of Voos. This consists of making an exposure with the patient prone with the left side elevated, thus thrusting the pyloric canal by palpation. The signs of hypertrophic pyloric stenosis are a sharp cutting off of the shadow in front of the

pylorus, definite displacement of the permanently narrowed and elongated canal toward both sides, absence of peristalsis in the canal, and failure of the duodenal bulb to open.

The history of the operation is interesting. It is known that the French always call the procedure the Fredet operation. Fredet first performed the extramucous Heinecke-Mikulicz pyloroplasty but his report of it failed to make a lasting impression on the medical profession and he later abandoned the method in favor of gastro-enterostomy. Weber revived the procedure, but retained the transverse suture of the old pyloroplasty which Karsch had warned against because of the danger that the mucosal folds may spoil the results of the operation. Thus, the greatest confusion prevailed among pediatricians and surgeons when Rammstedt first performed the simple extramucous division of the pylorus in 1912. This method was derived on the basis of the chance observation, in a case in which the longitudinal incision could not be completed, that the longitudinal incision gaped sufficiently without it.

Medical treatment today still gropes with its entire resources with and without apparent success. It is compelled to find the correct method for each case by experimentation as the differentiation between mild and severe cases is uncertain (Baralbin). It has the disadvantage of requiring considerable time (conservative treatment, seventy also days, by intercurrent diseases. Replies to a questionnaire sent to 60 children's clinics revealed that of 191 fatalities, 17 were due to an infection (grippe, pneumonia, meningitis), otitis, nephropathia, pyrexia, and

With the exception of several modifications not to be recommended, the operative treatment of pyloric stenosis today consists of the Weber-Karsch operation. Operation first came into favor after the war following the good results obtained by Kirschner, Heile, and the author and after Eckstein's well-known report that the Schlosman Clinic operation was considered the treatment of choice.

The indications for operation will always depend more or less upon the experience of the individual pediatrician. The patient's social circumstances should be taken into consideration in every case as the danger associated with surgical treatment is no greater than that of the medical. Contra-indications are infections the decision to operate should be made with caution. If the hypertrophic pyloric stenosis first develops in the third month operation may be delayed as the symptoms usually disappear in the fourth month.

Rammstedt operates through a high midline incision because the low incision favors ventralization and postoperative hernia. He divides only the upper layers sharply. The deeper ones be divided down to the mucosa. Its blunt pointed finger is order to avoid injury to the duodenum. Good vision with

perhaps the aid of magnifying spectacles (Kirschner) is necessary to assure division of all of the muscle fibers. The danger of hæmorrhage is the only vulnerable feature of the operation. The author believes this danger to be less with blunt than with sharp dissection. If the bleeding does not stop after two minutes of sponge pressure, fine suture-ligatures should be introduced or a bit of omentum applied. As a rule Rammstedt prefers ether anaesthesia, but in the presence of lung infections he uses chloroform anaesthesia. While local anaesthesia is widely employed by others, Rammstedt apparently disapproves of it as usually it is inadequate and it favors shock. Good pre operative treatment consists of infusions of a solution of glucose or sodium chloride, gastric lavage with sodium chloride solution or tea, and the prevention of chilling. An adequate number of experienced assistants and a special instrumentarium are required. The postoperative care by the pediatrician is often the more difficult task and should be carried out according to Eckstein's principles.

Of 143 postoperative deaths, 58 were due to injuries present before the operation, 35 to grippe and pneumonia, and 50 to the operation (peritoneal infection, wound suppuration, prolapse of the viscera, postoperative hæmorrhage, injury from the anaesthetic, intestinal obstruction from volvulus, adhesions, or inadequate myotomy). It is by no means true that persistence of the explosive vomiting is always due to inadequate surgery, it may be of central origin (Eckstein, Adalin) or the result of too rapid reunion of the margins of the incision or the portio-like invagination of the pyloric muscle into the duodenum which was demonstrated histologically by Noetzel and cannot be reached with the knife without opening the duodenum. It may be due also to dilatation of the stomach with kinking of the duodenum over the hepatoduodenal ligament.

Comparison of the statistics for 1929 and 1933 which Rammstedt collected by questionnaires shows that the number of operations increased from 27 to only 31 per cent and the total number of deaths decreased from 18 to 10.7 per cent. The medical mortality fell from 16 to 9 per cent and the surgical mortality from 22.5 per cent to 14.4 per cent. The total number of treated cases of hypertrophic pyloric stenosis increased from 1,824 in the period from 1919 to 1928 to 2,432 in the period from 1929 to 1933. This indicates that better diagnosis and earlier adequate therapy were the chief causes of the improvement.

In order to compare the surgical and the medical treatment, the Duesseldorf Clinic carried out the well-known experiments in which, prior to 1928, 92 cases were treated by purely conservative measures with a mortality of 18.8 per cent and since that time 110 cases were treated by exclusively surgical treatment with a mortality of only 3.6 per cent. These results speak unconditionally for operative treatment even when they are compared with the good results obtained by Ibrahim (81 cases treated in the

period from 1929 to 1933 with a mortality of 6 per cent), especially as the shorter period required for treatment and the lower incidence of intercurrent diseases constitute further advantages of surgery.  
(SIEVERS) LEO M. ZIMMERMAN, M.D.

**Bonney, V.** The Functional Derangement of the Intestine That Follows Abdominal Operations. *Lancet*, 1934, 227 1323

Operations that open the peritoneal cavity or, without opening it, involve the tissues in juxtaposition to it cause a derangement of the intestines characterized by general or regional cessation of intestinal movement and a disturbance of the mesenteric circulation. As a result, the gas balancing mechanism is upset and gaseous distention ensues. If the motor and vasomotor phenomena are marked and prolonged and high grade distention occurs, the venous return from the intestinal vessels suffers additional retardation due to the stretching of the mesentery and the increase in the intraperitoneal pressure, the wall of the distended intestine becomes paralyzed, and kinking occurs at many points, producing a series of mechanical obstructions. The obstruction to the flow of blood through the mesenteric veins is followed by exudation into the lumen of the intestine which is most marked in the section where the venous congestion is greatest and the fluid exuded undergoes a change whereby it becomes toxic.

These events are not specifically related to operative injury or exposure of the intestine, as they may occur after operations which do not open the peritoneal cavity. This fact and the fact that the operative area is very commonly at a distance from the area in which the phenomena occur can be explained only by the hypothesis that the motor and vasomotor disturbances in the intestine, which are fundamental to the derangement, are caused by an agent generated somewhere in the tissues traumatized by the operation. The evidence available suggests that the production of this agent has some relation to partial interference with the circulation.

SAMUEL KAHN, M.D.

**Gardner, C. E., Jr., and Hart, D.** Anomalies of Intestinal Rotation as a Cause of Intestinal Obstruction. Report of Two Personal Observations, Review of 103 Reported Cases. *Arch Surg*, 1934, 29 942

Gardner and Hart state that in the practice of abdominal surgery a clear conception of the various possibilities of derangement of internal rotation and fixation is essential. Following a description of the stages of normal intestinal rotation and the possible abnormalities in each, they report 2 cases of volvulus of the entire mesentery presenting symptoms of chronic duodenal obstruction and review 105 cases of intestinal obstruction incident to abnormalities of intestinal rotation which they collected from the literature. Of the latter, 48 were cases of volvulus of the entire mesentery, 10, cases of obstruction of



## INTERNATIONAL ABSTRACT OF SURGERY

the transverse colon secondary to reversed rotation and 7 cases of obstruction of the duodenum by abnormal intestinal fixation. Volvulus of the entire mesentery may cause symptoms of acute intestinal obstruction. In the majority of cases the picture is that of acute, chronic, or intermittent obstruction of the duodenum below the ampulla without the usual evidences of volvulus. The operative treatment for each type of obstruction is discussed.

JOHN W. NIXON, M.D.

Elman, R.: The Danger of Sudden Deflation of the Acutely Distended Bowel in Late Low Intestinal Obstruction. *Am J Surg* 924: 438.

Elman reports in detail four cases in which death occurred suddenly several hours after the relief of low intestinal obstruction. He states that in the opinion of many surgeons the lethal factor in such cases is rapid absorption by the healthy bowel of the toxic contents from the obstructed intestine. His own observations suggest that overwhelming toxicemia and death following the sudden relief of intestinal obstruction are due to the lowering of the intraluminal pressure which, when high enough to interfere with the blood flow through the gut, is an efficient barrier between the fecal contents and the circulation. He therefore recommends slow deflation of the distended bowel to allow re-adjustment of the circulation and prevent the effects of the rapid absorption following sudden deflation. In all of his cases in which the bowel was deflated slowly the patient recovered.

Hesscock, C. H.: Calcification in Intestinal Tuberculosis. *Am J Roentgenol* 924: 378.

Following brief discussion of the role of calcification in tuberculosis, the author states that although calcification does not necessarily mean tuberculous infection, it is common in old tuberculous foci whereas infections of other types it is rare. Common sites of calcareous deposits in tuberculous sites are: scrobed. Apparently calcification occurs also in primary lesions of intestinal tuberculosis as well as in the abdominal lymph glands which are affected secondarily. Although Hesscock has been unable to find scattered milky areas of calcification especially in the walls of the cecum in four cases in which the clinical and roentgenological findings warranted the diagnosis of intestinal tuberculosis. He reports these cases in detail with numerous roentgenograms.

Hesscock ascribes the infrequency of such deposits to the fact that most cases of intestinal tuberculosis are of the ulcerative type without caseation. He states that at times the infection penetrates the wall of the intestine and the barium is formed on the peritoneal surface. The shadows in the roentgenogram are more suggestive of calcification at this site and give the appearance of milky nodules. He reports tubercles which, in some instances, have become confluent. Hesscock reports case to show

the site of such deposits. As none of the cases reported came to operation or autopsy, pathological study was impossible.

ANNE HARTLEY, M.D.

Rankin, F. W. and Martin, W. J.: Diverticula of the Small Bowel. *Ann Surg* 924: 40-43.

Diverticula of the small bowel is much less frequent and causes much less trouble than diverticula of the colon. Diverticula of the small bowel other than that occurring in the duodenum and the diverticulum described by Meckel is found only about once in 5,000. X-ray examinations. A typical chain of symptoms can be ascribed to it. In cases of uncomplicated diverticula, complications of the bowel is involved, surgery must be considered. Although surgical intervention is warranted occasionally, careful medical management appears to be the best procedure as a rule.

J. THOMAS WILKINSON, M.D.

Joyce, T. M.: Tumors of the Small Intestine. *Ann Surg* 924: 40-44.

While tumors of the small bowel have always been considered rare, numerous reports of such tumors have been published recently and some of them have cited rather large series of cases. The clinical syndromes caused by the neoplasms is vague, and in relatively few instances is the diagnosis made before operation or autopsy. In a review of eighty-eight cases of tumor of the small intestine reported by Rankin, the incidence of malignancy in the small intestine reported by Rankin has been 43 per cent. Carcinoma of the small intestine occur in the duodenum. On the basis of their point of origin, duodenal carcinomas are divided into the pre-ampullary, the ampullary and the post-ampullary types. The greatest number occur in or about the ampulla of Vater. The next most common site of carcinoma in the small intestine is the jejunum.

The symptoms of tumors of the small intestine are due chiefly to obstruction which frequently is partial or intermittent. When intussusception occurs, the symptoms of total obstruction rapidly develop. Intussusception occurs in about 5 per cent of cases of tumor of the small intestine. Hemorrhage, either gross or microscopic, is another important sign. The chief aid in the diagnosis of such tumors is X-ray examination.

Joyce reports nine cases of tumor of the small bowel. In the first case a rapidly growing leiomyoma was found in Meckel diverticulum. In the second, intussusception was caused by a tumor the size of the thumb in the lumen of the distal ileum. In the third, the tumor was benign papillary adenoma of the jejunum. In the fourth, large intraluminal and polypoid leiomyoma of the jejunum was accompanied by full roentgen in the fifth an inoperable adenocarcinoma was found at the junction of the jejunum with the ileum. In the sixth, highly malignant

carcinoma was resected and the patient was still well at the end of thirty months. In the seventh, there was an annular adenocarcinoma of the third part of the duodenum with abdominal metastases. In the eighth, an annular carcinoma developed in the wall of the jejunum about 10 cm beyond the ligament of Treitz and a large metastatic retroperitoneal tumor was found behind the third portion of the duodenum. In the ninth, operation was refused and autopsy two months later revealed a primary carcinoma of the ileocaecal junction and bronchopneumonia.

Attention is called to the wide variation in the histories and the frequency with which the diagnosis is missed. The author states that the possibility of a tumor of the small intestine should be considered in cases of unexplained gastro intestinal bleeding and intermittent obstruction.

JOHN W. NUZUM, M.D.

Steinberg, M. E., and Starr, P. H. The Factor of Spasm in the Etiology of Peptic Ulcers. *Arch Surg*, 1934, 29, 895.

The authors cite the fact that Exalto, in 1911, was the first investigator to develop a technique which regularly produces chronic ulcers of the jejunum following diversion of the duodenal contents. Winkelbauer modified the Exalto operation by stripping for a distance of from 15 to 25 cm the longitudinal and circular muscles of the jejunum which was anastomosed to the stomach. He reported that two dogs subjected to this procedure survived for thirty-four and seventy days respectively without developing the usual ulceration. The authors repeated Winkelbauer's experiments on a larger series of animals.

Of seven dogs subjected by the authors to the Exalto operation in which the jejunum is anastomosed end to end to the pyloric valve, all developed acute or chronic ulcers during a survival period of from five to sixty-nine days. With the use of these animals as controls, another group of dogs were subjected to the original duodenal diversion type of operation and to stripping of the longitudinal and circular muscle of the jejunum for a distance of about 10 cm. However, beginning at the pyloric valve, a narrow strip of muscle was left at the mesenteric border for preservation of the blood supply. In addition, a small circular part of the duodenal muscle near the pylorus was left because the jejunum was anastomosed end to end to the pyloric valve before the stripping was done.

Ten of the latter group of animals survived for from seven to seventy-six days. In none of the ten animals in which the jejunal musculature was stripped for three fourths of the circumference of the bowel was there any mucosal ulceration. However, two of the dogs had small chronic ulcers near the pyloric valve where the musculature remained intact, one had a large ulcer where the muscle layer of the jejunum began its normal intact course, and one of the dogs with a small ulcer near the pylorus

had two small typical chronic ulcers in the mucosa where the muscle layer began its intact course.

Of another series of dogs in which the small intestine was anastomosed to a Pavlov pouch and the circular and longitudinal muscle layers were stripped for a distance of 10 cm distal to the anastomosis, six survived for from eleven to one hundred and fifteen days. In none of these animals did an ulcer develop where the muscle was stripped.

The findings of Boldyreff, Burget and Steinberg, Elman, and Cannon suggest that acid chyme of a certain concentration causes the intestinal muscles to contract. The contraction is supposed to hold the acid in one place until it is neutralized, thereby possibly causing localized trauma to the mucosa with resulting inflammation or ulceration. The inability of the intestine without muscle to contract and thereby cause retention of acid chyme is suggested as an explanation for the absence of ulceration in loops of bowel stripped of musculature.

In view of the theories of von Bergmann, Cushing, and others on the relation of neurogenic factors to gastroduodenal ulcers, the authors believe that their findings may be of significance in the etiology and pathogenesis of gastroduodenal ulceration.

SAMUEL J. FOGELSON, M.D.

Kantor, J. L. Anomalies of the Colon. Their Roentgen Diagnosis and Clinical Significance. A Résumé of Ten Years' Study. *Radiology*, 1934, 23, 651.

This article is based on 2,000 cases in which the large bowel was studied roentgenologically. The author divides anomalies of the colon into the following groups: redundancy, non-rotation, hypodescent, hyperdescent, hypofixation, and hyperfixation.

Redundancy of the colon was found in 18 per cent of the cases reviewed. The chief symptom of the majority of the patients with this condition was constipation.

Non rotation of the colon was found in only 0.2 per cent of the cases reviewed. It was usually associated with non rotation of the entire intestinal tract and was asymptomatic.

Hypodescent of the cæcum was found in 6 per cent of the cases. It was not characterized by a syndrome. However, the author believes that it is associated with an increased tendency toward the development of appendicitis.

Hyperdescent of the cæcum was found in 18 per cent of the cases and appeared to be definitely associated with discomfort in the right lower quadrant of the abdomen, headache, and vomiting. The author describes in detail the roentgen technique by which it is possible to determine whether the cæcum is abnormally high or low.

Excessive motility (hypofixation) of the colon was found in 4 per cent and hyperfixation in 20 per cent of the cases reviewed. Kantor states that the former is frequently associated with a high position of the cæcum and is a prerequisite for volvulus and intussusception. Hypofixation of the cæcum alone is

associated with increased colonic irritability. Excessive fixation of the colon is associated with a low position of the cecum, duodenal bands, and irritability of the large bowel.

Unless a colonic abnormality results in mechanical obstruction, treatment should be conservative and symptomatic.

T. RAYMOND JONES, M.D.

Dall'Aqua, V., and Valacchi, R. The Roentgen Appearance of the Mucosa of the Colon in Pathological Conditions (*L'aspetto radiologico della mucosa del colon negli stati patologici*). *Radiol med.* 924, 113.

This article is sequel to a report on the roentgen appearance of the normal mucous membrane of the colon. The authors divide lesions of the colon into three main groups, non-specific and specific colitis, and discuss each condition in these groups separately.

#### NON-SPECIFIC COLITIS

*Acute colitis with mild changes in the mucosa.* In this condition roentgen examination shows an increase in the size and an abnormal disposition of the folds. The folds are apparently fewer in number, less elastic, and not easily flattened. The cecum may or may not be distended completely. Often there is a granulated, tapeworm-like appearance of the surface.

*Acute colitis with serious changes in the mucosa.* In this condition there is great variation in the pathological anatomy and X-ray findings. The barium may be deposited in transverse ridges with marginal notches or its arrangement may suggest the drawers or button like formations. Freshly narrowed soft, loose, or button like formations. Most of these forms are well shown in the roentgenograms. The authors discuss them on the basis of the pathological anatomy and the findings in the surgical specimens.

*Chronic colitis.* In this condition there is usually evidence of atrophy of the mucosa with reduction in the size and number of the folds. The folds may show a longitudinal disposition. At times the colon has the appearance of an inert tube and at other times shows defects due to nodule-like hypertrophic masses with occasionally thick transverse bands.

#### SPECIFIC COLITIS

*Tubercular.* In the ulcerative type of tuberculous of the colon the mucosa seems severely compromised, but as a rule only in the right colon. The mucosa sometimes remains somewhat conserved, but has lost their normal contour. In the fibroplastic type of tuberculous of the colon the predominant changes result in thickening of the wall and reduction of the size of the lumen. The internal relief is almost always markedly altered or lost. Material passes out of the involved segment very rapidly.

*Leuc.* In this condition there may be a fixed and rigid stenosis of an inflammatory type.

*Actinomycosis.* In this condition there are no characteristic changes.

In addition the authors describe briefly and show by roentgenograms some of the findings in cases of colonic diverticula, diverticulitis, polyposis, malignant tumors, and stenoses.

In the discussion they emphasize especially the importance of interpreting the roentgenograms on the basis of the physiology of the bowel.

The article is followed by a rather extensive bibliography.

A. LOOM ROSE, M.D.

David, V. G. The Pathology and Treatment of Bleeding Polypoid Tumors of the Large Bowel. *Ann. Surg.* 924, 700-733.

David classifies polypoid tumors of the large bowel as follows: (1) adenomata, which are generally pedunculated but sometimes flat; (2) papillomata or villous tumors; (3) multiple polypoid lesions involving the entire colon; (4) inflammatory polyps, found in amoebic dysentery and ulcerative colitis; and (5) carcinosarcomata grossly resembling flat adenomata or papillomata.

The most vital question to be answered concerning these tumors is whether the benign appearing single adenoma or papilloma is a premalignant growth. The statement is frequently made that all adenomata and papillomata of the large bowel will eventually become malignant. This is based in part on the overwhelming evidence of the development of carcinosarcoma in nearly all cases of multiple polypoid polyps of this type, and in part on the histological appearance of very early invasion of the basement membrane in papillomatous tumors which appear benign.

This article is based on fifteen papillomata, twenty-five pedunculated polyps in adults, and more than fifteen polyps in children. According to the histological criteria laid down by Feyrter only one polyp was malignant. David states that when any gross evidence of ulceration, invasion, or induration is noted on the surface or at the base of the polyp it must be considered evidence of malignancy and the tumor should be treated as malignant neoplasm. The most important histological evidence indicating malignancy is destructive invasion of the epithelium through the basement membrane and muscularis mucosae of the bowel wall.

The pedunculated type of adenoma, the pedicle of which consists of normal mucosa stretched out by the tug of the tumor, occurs at all ages and in all portions of the colon. Early malignant degeneration of tumors of this type is rarely observed although the neoplasms are frequently found in the colon which is the site of well-developed adenomas. The papillomata or villous tumors, which are soft, sponge-like, borecent neoplasms, bleed easily and produce a large amount of mucus because of the large numbers of goblet mucous secreting cells present. They occur usually in adult life. Biopsy of superficial portions for the determination of malignancy is unreliable. If induration is present

at the base, the tumor should be treated as malignant and the bowel resected

It is generally agreed that when multiple polyposis is present and the colon is studded with polyps of all types, preliminary ileostomy followed by graded removal of the colon is advisable. Occasionally, carcinomata grossly resembling large flat adenomata or papillomata are found in the colon. In such cases a palpable induration is discovered at the base of the tumor and in the colon there may be a small area which shows puckering of the bowel wall. It is at this point that invasion of the bowel wall is taking place. Viewed through the proctoscope the lesions may appear benign, but as a rule their surfaces are ulcerated. It is most important to remember that all of the polypoid bleeding tumors of the rectum and colon must be regarded with suspicion as regards malignancy even though we know that many of them are benign and remain benign for relatively long periods of time.

JOHN W. NUZUM, M.D.

Bowen, W. H. A Study of the Etiology of Appendicitis. *Guy's Hosp. Rep.*, Lond., 1934, 84, 489.

The author bases his conclusions with regard to the etiology of acute appendicitis on clinical observations, pathological examination of surgically removed appendices, and a review of the literature. He believes that acute appendicitis starts as an infective catarrh, that an infective catarrh is the first stage of every case from those of early congestion of the mucous membrane to those of extreme degrees of gangrene. The condition is not due to enterogenous or hæmatogenous sources. The onset of acute appendicitis in the absence of a stercolith or obstruction is difficult to explain. The acute changes are probably the infective superadded changes grafted onto and obscuring the original catarrh. The gravest manifestations of the disease result from the mechanically irritating action of a stercolith.

EARL O. LATIMER, M.D.

McKissock, W. Hæmaturia in Appendicitis. *Lancet*, 1934, 227, 1389.

This article is based on fifty cases of appendicitis associated with hæmaturia. Seelig, in reporting three cases, attributed hæmaturia associated with appendicitis to the following factors: (1) toxic nephritis with circulation in the blood stream of toxins produced by the acute appendicitis, (2) direct involvement of the kidney or renal pelvis by an inflamed appendix lying in a retrocæcal position, (3) direct involvement of the ureter, and (4) direct involvement of the bladder by an inflamed appendix or a retrocæcal abscess.

McKissock believes that appendicitis may be a symptom of a general disease of which acute nephritis also is a symptom or complication. One of his patients presented both acute appendicitis and nephritis as complications of a streptococcal infection of the throat. He states that the development of toxic nephritis as the direct result of acute appen-

ditis still remains to be proved. Confusion is most likely to arise in cases in which hæmaturia occurs in association with signs and symptoms otherwise suggestive of acute appendicitis. When red blood cells are found in the urine, a diagnosis of pyelitis or urinary colic might well be made and the presence of acute appendicitis overlooked. McKissock reports a case in which the blood came from the ureter. He believes the bleeding might have been due to congestion of the veins of the ureter caused by the external pressure of an inflammatory exudate or to a ureteritis.

JOHN W. NUZUM, M.D.

Gile, J. F., and Bowler, J. P. The Management of Perforated Appendicitis. *J. Am. Med. Ass.*, 1934, 103, 1750.

This article is based on 901 cases of perforated appendicitis. The authors discuss the management of 3 types of the condition: (1) gangrenous appendicitis with local peritonitis, associated usually with early perforation, (2) appendiceal abscess, and (3) perforation with general peritonitis.

In all of the cases reviewed the treatment was based on a program of immediate operation following a positive or reasonably well founded diagnosis of appendicitis. The authors are convinced that immediate operation in early peritonitis may prevent the development of diffuse peritonitis which has a considerably higher mortality, that appendiceal abscess is a lesion which is originally, and remains throughout its duration, restricted to a localized process by the morphology of the right lower abdomen and does not call for urgent measures, and that late general peritonitis has an enormous mortality. They state that, except in the cases in which the surgical risk is obviously entirely hopeless when the patient is first seen, there will always remain, in this group, cases in which it will be difficult to arrive at a decision regarding delay and pre-operative treatment.

J. THORNWELL WITHERSPOON, M.D.

Carlucci, G. A. Abdominal Wall Defects Following Appendicectomy. *Ann. Surg.*, 1934, 100, 1177.

The author reviews 700 cases of appendicitis in which operation was performed through an incision in the right lower quadrant of the abdomen. All of the cases were followed for at least six months. In 83 (12 per cent) there was some postoperative abdominal defect. The defects ranged from simple weakness to hernia involving the entire length of the incision.

Defects were approximately twice as frequent following a split rectus incision as following the McBurney incision, and about twice as frequent in males as in females. They had apparently no relation to postoperative respiratory complications.

In cases of appendiceal abscess in which the abdominal wall was not sutured or was approximated only loosely, the incidence of incisional hernia was high. However, faecal fistulae *per se* did not seem to produce defects. Pregnancy and parturition, even in cases in which drainage was established, appar-

## INTERNATIONAL ABSTRACT OF SURGERY

ently did not cause the incision to give way. Defects were most common in cases in which drainage was established. A fairly large number occurred also in cases in which the wound became infected.

It was found that weakness and even hernia disappear in time, and that hernia may develop suddenly a year or more after the operation.

Piccinino, G. Stierlin's Jump and Hyperplastic Intestinal Tuberculosis (Salto di Stierlin, tuber colon intestinale sperplastica). *Radiol. med.* 1914.

The author cites his previous publications on tuberculosis with special reference to the differential diagnosis of lesions of the right colon. He states that it must not be assumed that all lesions of the right colon in tuberculous patients are due to tuberculosis.

He reviews the essential features of hyperplastic tuberculosis of the intestine and discusses relationship of the condition to primary foci, (a) pathological anatomy and the usual clinical history. X-ray examination after the administration of barium by mouth usually shows altered filling of the diseased portion. The barium may jump over the diseased segment completely or fill it only partially and irregularly. When the opaque medium is given by enema, complete filling of the diseased portion is often impossible. The segment tends to empty its contents rapidly, and canalization and obstruction is often with valvular insufficiency are common.

Piccinino reports five cases of hyperplastic tuberculous of the intestine. The process began in the distal loops of the small intestine which was extremely deformed and showed rigidity and stenosis. In all, the cecum and ascending colon were involved and suggested an external strangulation force causing gradual reduction of the lumen. The contours were irregular filling was poor and changes in the folds were easily distinguished. Niche like formations in the shadows, rapidity of the walls of the altered zones, and absence of muscular contractions were common.

In discussing the differential diagnosis, Piccinino calls attention especially to neoplasms of the cecum and the slight deformities which are seen occasionally in chronic appendicitis.

Thygesen, T. E. H. Simple Hemorrhagic Proctitis and Proctocolitis. *A. Loos Roos, M.D.* *Acta med. Scand.* 1914.

The author discusses simple hemorrhagic proctitis and proctocolitis on the basis of twenty cases. He states that the condition may occur at any age, but is most frequent in the young. Its onset is usually insidious and afebrile. In only one of the early cases reviewed was it acute, febrile, and associated with diarrhea.

The condition runs a very protracted course and has a pronounced tendency to recur periodically. Except in cases with an acute febrile onset, in which

the patient may be intoxicated, it does not affect the general condition to any marked degree. The chief sign is bleeding on defecation or independent of defecation.

Routine physical examination discloses little abnormality. The temperature is usually normal, but in a few cases (two of the twenty reviewed) it is somewhat elevated in the early stage. The condition does not cause any considerable degree of anemia. The rectoscopic picture is characteristic, but sigmoidoscopy and enemas are not observed even in cases in which the condition has been present for many years.

Microscopic examination discloses intense inflammation of the mucosa with marked distention of the blood vessels and free hemorrhages into the lamina propria. The inflammation does not involve the deeper parts of the rectal wall nor lead to necrosis or stricture.

The disease is probably of specific infectious origin. Its course is benign. Treatment with rectal infusions of a 1 per cent solution of yarrow has yielded good results, but does not tend to be continued for a long time because of the marked tendency of the disease to recur.

Milligan, K. T. C., and Morgan, C. N. The Surgical Anatomy of the Anal Canal. *Lancet* 1914, 197.

Although today inconfluence of feces after surgical treatment of anal fistula is rare, failure of the fistula to heal after operation is by no means uncommon. There are various reasons why such failure remains unhealed. In some cases the surgeon has not succeeded in discovering the main track of the fistula into the anal canal. In others, he has erred in estimating the amount of the sphincter and that can be cut with safety and in a third group he has erred in estimating the amount of muscle that must be preserved for function and continence. The authors therefore present a detailed anatomical description of the muscles of the anal canal.

The external sphincter of the anus is triangular muscle which, together with the puborectalis portion of the levator ani, forms a strong muscular cylinder encircling the longitudinal muscle of the rectum, the internal sphincter and, below this level, the anal canal. The external sphincter muscle consists of three portions, the inner of which may be separated. These portions are the sphincter and superficialis, and the sphincter and externus muscles. The first and sphincter and externus muscles are not attached to the coccyx. The second portion is attached to the coccyx. The third portion of the longitudinal muscle of the rectum is the internal sphincter and the longitudinal muscle. The three divisions of the septa surround the anal canal alone, the longitudinal muscle, the internal sphincter and the anal band of muscle directly encircling the lowest

portion of the anal canal. It is easily seen and felt beneath the skin and lies in the same plane as the internal sphincter from the lower border of which it is separated by an annular band of fascia, the anal intermuscular septum.

The anal intermuscular septum, which is the termination of the longitudinal muscle of the anal canal, is attached to the skin of the anus in the region of the mucocutaneous junction and is of importance in disease and surgery of the anal canal. The constant position of the main tracts and openings of fistulæ into the anal canal shows a relation to the septa of the longitudinal muscle. Suppuration spreads along these tissue planes. The attachment of the termination of the longitudinal muscle explains the presence of the sulcus in interno-external prolapsed and thrombosed piles.

The sphincter ani externus superficialis is an elliptical muscle lying between the subcutaneous sphincter below and the sphincter externus profundus. It is the only layer of the sphincter ani externus attached to the coccyx. It inserts into the perineal body.

The sphincter ani externus profundus consists of an annular band of muscle passing behind the rectum. Its fibers cross above the rectum to the opposite side, where they are attached to the ascending ramus of the ischium, representing the trans-versus perinei muscle.

The levator ani muscle may be divided into three portions, the puborectalis, which is of most importance in rectal function, and the iliococcygeus and the pubococcygeus, which have no physiological influence upon the rectum.

The puborectalis portion of the levator ani arises from the symphysis under cover of the pubococcygeus. Its fibers pass backward and downward around the lower and lateral aspect of the rectum, meeting the fibers of the opposite side behind the anal canal and forming a powerful sling to draw the anorectal junction toward the symphysis pubis. Its lower border is intimately attached to the external sphincter ani profundus. Between these sling fibers and the anal canal are the downward prolongations of the longitudinal muscle of the rectum and the sphincter ani internus.

The sphincter ani internus is a tubular muscle encircling almost the whole length of the anal canal. It is a direct continuation of the circular muscle wall of the rectum. This muscle is not the sole guardian of continence. Continence depends upon the composite anal ring. The inner surface of this ring is covered with mucous membrane which is separated from the muscle by the submucosa in which run the hæmorrhoidal vessels.

Identification of these muscles can be made with the palpating finger. To treat anal fistulæ successfully the surgeon must be skilled in palpating the anorectal ring. The anorectal ring is a fibromuscular band composed of the upper portion of (1) the internal sphincter, (2) the longitudinal muscle, (3) the puborectalis, and (4) the external sphincter ani

profundus muscles. If this ring is cut, loss of continence will result, whereas when even the narrowest complete ring of muscle remains control is preserved. All of the anal muscles below this ring may be divided in any manner without causing loss of control.

An anal fistula is the contracted cavity of an abscess which has failed to heal completely by third intention. There are usually an external opening, a main tract, and an internal opening. Many variations in the form of multiple subcutaneous secondary tracts and openings occur. The external opening is usually visible. The main tract may be followed with a fine diagnostic probe. The internal opening of a fistula is more easily discovered by light palpation of the anal mucosa than by inspection with the proctoscope. For safe surgical treatment the relationship of the internal opening and main tract to the anorectal ring must be determined by palpation upon a probe passed along the tract. It should be noted whether they lie above or below the ring.

For the cure of an anal fistula it is necessary to convert the fistulous tract into an open flat wound by incising along the whole tract and removing the overhanging edge.

In the past, the main problem, the relationship of the fistulous tracts to the anal musculature, has been obscured by a complicated classification based on the shape and direction of the subcutaneous tracts. The following classification is submitted as being simple and practical.

- 1 Subcutaneous and submucous fistulæ. These fistulæ are superficial to all the sphincter muscles. In the treatment of the subcutaneous fistulæ the whole tract is incised and the overhanging skin edges are excised. In the treatment of the submucous fistulæ the mucosal roof is destroyed by strangulating ligatures because the often tortuous tracts lie in close relation to the hæmorrhoidal plexus in the submucosa which may give rise to troublesome hæmorrhage if incision is done.

- 2 Fistulæ with their main tracts entering the anal canal below the level of the anorectal ring.

- a Low level anal fistulæ usually enter the anal canal along the anal intermuscular septum between the subcutaneous external sphincter and the lower border of the internal sphincter ani. There may be a submucous extension of the main tract. The whole tract is laid open by incision or combined with strangulating ligatures and the subcutaneous external sphincter is divided.

- b High level anal fistulæ present a less common and more difficult problem. The main tract usually enters the anal canal in the posterior segment just below the anorectal ring. The position and relationship of the tract to the anorectal ring must be accurately established. If the relationship of the tract to the anorectal ring cannot be determined definitely the two-stage operation may be performed. However, it has no other advantage over the one-stage operation. If an intact part of the anorectal ring lies above the probe inserted into the tract, section of the whole muscle bundle lying below the

## INTERNATIONAL ABSTRACT OF SURGERY

probe may be done. This will probably sever a part of the deep, all of the superficial, and all of the subcutaneous external sphincter as well as the subopoiding related parts of the internal sphincter and longitudinal muscles. Thus a satisfactory flat granulating wound is surgically obtainable and incontinence is prevented.

Unless the relation of the anorectal ring has been established previously light general anesthesia is to be preferred to spinal anesthesia because in the latter the muscular relaxation is so great that the anorectal ring is not palpable.

Anal fistulae with the main tract or sinus extending above the anorectal ring are of three types extending first type, which are most difficult to heal, are characterized by an opening into the rectum above the anorectal ring. In those of the second type, a sinus extends above the anorectal ring but does not penetrate the rectum. In those of the third type there is a sinus like that in fistulae of the second type and, in addition, there is an offshoot opening to the rectum below the anorectal ring.

Anatomical considerations prevent the conversion of such deep tracts in the ischioanal fossa into a flat wound which would assure healing and continuous tract posteriorly toward the coccyx. To retard the re-formation of sinuses by rapid skin healing all of the unimportant skin floor of the ischioanal fossa should be liberally removed so that a wide funnel-shaped wound extending from the floor to the roof of the fossa remains.

The internal opening into the rectum in fistulae of the first type should be disregarded. As the depth of the wound fills with granulation tissue it usually closes. Later when the wound level is well below the anorectal ring the sphincter muscles below the wound will also be gattered and healing by second intention will be hastened. Routine pathological examination is urged for this type of sinus or fistula as it sometimes reveals tuberculosis as the cause.

J. EDWIN KIRKPATRICK, M.D.

## LIVER, GALL BLADDER, PANCREAS, AND SPLEEN

Ivy A. C. and Bergh G. S. Applied Physiology of the Extrahepatic Biliary Tract. *J. Am. Med. Ass.* 934, p. 900.

The gall bladder has three types of activity—absorption, secretion, and motor activity. In the process of absorption the gall bladder concentrates the hepatic bile that enters it from four to ten times. In this process, the bile which is alkaline as it leaves the liver is slightly acidified.

Because of its concentrating function, the gall bladder though small, has a large capacity. It is able to store the entire twenty-four-hour output of hepatic bile.

The gall bladder with acute inflammation of its mucosa does not concentrate or evacuate the bile.

After subsidence of the acute inflammation, concentration and evacuation may be resumed, but if fibrosis results, concentration does not occur.

Cholesterolemia does not interfere with the concentrating activity or evacuation of the gall bladder unless it is associated with a moderate or severe cholecystitis.

When the gall bladder is normal it secretes a serous fluid at the rate of about 30 cc. in a period of twenty-four hours. When it is acutely inflamed a considerable quantity of Empid and sometimes blood-tinged fluid is formed by the mucosa.

When the common duct is obstructed for from twelve to fourteen days green fluid is found in the ducts if the gall bladder is normal and white fluid if the gall bladder is functionless. While bile, which is of the greatest concern to surgeons, is found under the following conditions: (1) common-duct obstruction, (2) toxic hepatitis, and (3) high grade generalized hepatitis. It is associated with a toxic or should be used as it favors the activity of the liver cells.

The motor activity of the gall bladder is of two types: (1) rhythmic tonus changes and (2) tonic contraction of the musculature of the gall bladder as a whole.

It is obviously significant that the power of the normal gall bladder to contract is no greater than the secretory pressure of bile.

The chief stimulant of gall bladder contraction thus far discovered is the hormone cholecystokinin. This hormone may be extracted from the duodenal mucosa.

The most effective extractants of hormone production are acids and fats acting in the upper part of the intestine. All fats are effective, but egg yolk and cream appear to exert the most definite action. Next most effective are proteins, particularly those of meat. Carbohydrates have no effect.

Whether the gall bladder will evacuate or not when it is stimulated depends on the tone of the sphincter of Oddi. The sphincter of Oddi can resist a pressure of 75 cm. whereas the maximum expulsive pressure of the normal gall bladder is 30 cm. Hence it is possible for a spastic sphincter or duodenum to prevent gall-bladder evacuation.

The fact that the sphincter of Oddi becomes incompetent soon after removal of the gall bladder supports the Doyon-Meltzer concept and shows that the gall bladder has a functional relation to the duodenum. Other facts pertaining to the physiology and functional pathology of the sphincter of Oddi may be summarized as follows:

1. Any procedure that increases the muscular tone of the duodenum inhibits the flow of bile into the duodenum.
2. Any procedure that decreases the tone of the duodenum favors the flow of bile.

3 Chemical irritation of the duodenum delays evacuation of the gall bladder

4 Atropin favors the flow of bile into the duodenum and pilocarpin stops the flow of bile

5 Morphine tends to inhibit the flow of bile into the duodenum because of its effect in increasing the tone of the circular muscle of the duodenum

6 Magnesium sulphate, magnesium oxide, and sodium sulphate favor the flow of bile

7 In cases of cholecystitis or duodenal ulcer the sphincter may be hypertrophied

8 It is reported that some time after cholecystectomy the sphincter may become competent or may undergo hypertrophy

9 In animals without a gall bladder the sphincter resistance is less than in animals with a gall bladder

Westphal has described two major types of motor dysfunction of the biliary passages

1 Hyperkinetic (a) hypermobile, characterized by increased motility of the gall bladder and ampulla with rapid emptying, and (b) hypertonic, characterized by contraction of the gall bladder against spasm of the sphincter with spastic distention and colicky pain.

2 Atonic, characterized by relaxation or atony of the gall bladder with spasm of the sphincter of the papilla causing atonic distention of the gall bladder with a mild, continuous, heavy aching sensation

Prevention of gall-bladder disease may be aided by daily evacuation of the viscus by the proper intake of fat.

In acute biliary tract disease not demanding immediate operation sedation had proved effective. Foods such as fats, meats, and acid fruit juices which stimulate gall-bladder activity should be withheld. The advisability of administering bile salts in cases of such disease to promote the formation of bile is to be seriously questioned.

The evidence strongly suggests that the gall bladder is not benefited by drainage. If the mucosa is not permanently damaged, the scarring incident to drainage may interfere with normal emptying.

It is now generally recognized that cholecystectomy is indicated definitely in cases of multiple small stones and cases of high-grade chronic cholecystitis with non visualization of the gall bladder. Unless it can be shown that cholecystectomy has a harmful effect, the operation will always be performed in borderline cases in which the gall bladder is suspected to be at fault.

HOWARD A. MCKNIGHT, M.D.

Stewart, W. H., and Illick, H. E. Sources of Error in Oral Cholecystography, with Suggested Methods of Correction. *Radiology*, 1934, 23, 663

A common cause of error in oral cholecystography is the failure of the patient to hold his breath while the film is being exposed. During the suspension of respiration holding the nose is often of assistance.

Antonucci demonstrated that oral cholecystography can be accelerated by increasing the glucose reserve of the body. Sandstrom found that the

shadows are intensified when the dye is given in fractional doses. On the basis of these findings and their own experience the authors have developed what they call an "intensified method of cholecystography." This procedure is as follows:

The afternoon preceding the test the patient is given tea with as much sugar as possible and one sweet cake. Immediately after the evening meal he is given 3.5 gm of tetra-iodophenolphthalein. No extra fats are included in the evening meal. The following morning no food is allowed. The study of the gall bladder is begun sixteen hours after the administration of the dye. Foods that do not empty the gall bladder are then permitted. Extra sugar is an important item. During the afternoon and evening, additional dye is given in small doses with sugar. The following day, before breakfast, forty hours after the first dose of dye, an examination of the gall bladder is made for maximum intensity of the shadow. Next, a fatty meal is given, and an hour later an examination is made to determine the contractility of the organ. Sometimes the patient must be kept under observation for a number of hours as the gall bladder empties.

The authors claim that stones and tumors are more easily recognized and faint shadows of cholesterol stones are visualized more readily by this method than by others. The bile ducts are clearly outlined in practically every case in which a gall-bladder shadow of normal intensity is obtained. Fluoroscopic examination of the gall bladder is practical.

In interpreting the findings the authors point out that absence of a shadow is sometimes due to a duodenal ulcer and sometimes to the presence of a large renal tumor. Regardless of the cause of the jaundice, the oral test fails to outline the gall bladder satisfactorily if the icterus index is over 30.

Benign growths, especially papillomata, are most likely to be seen along the margin of the gall-bladder shadow. They are seldom found in the lower portion. The defects may be multiple, but are discrete in contrast to those due to gall stones. Such negative areas may not appear until the gall bladder is partially empty. The defects due to adenomata are nearly always at the tip of the fundus and are more apt to be slit-like than round.

EARL O. LATIMER, M.D.

Larrabee, R. C. Chronic Congestive Splenomegaly and Its Relationship to Banti's Disease. *Am J M Sc*, 1934, 188, 745

On the basis of a study of forty-seven cases of chronic congestive splenomegaly, the author expresses the view that in the majority of patients presenting the clinical picture of Banti's disease, i.e., splenomegaly with fibrosis, microcytic anemia with leucopenia, and a late state with hemorrhage and ascites, the condition is dependent upon various intra-abdominal lesions obstructing the venous outflow of the spleen. By far the most common of these lesions is hepatic cirrhosis of various types. As



## INTERNATIONAL ABSTRACT OF SURGERY

Banti defined the disease which bears his name in such a manner as to exclude such cases, Larabee believes they should be designated by a distinctive name.

With regard to the choice of cases for splenectomy the author quotes Mayo as stating that the criterion should be the pathological condition of the spleen and its effect on the blood rather than the underlying cause. Larabee believes that the physician or surgeon confronted with a case need not trouble himself with theoretical questions as to the nature of Banti disease. If the Banti pre-operative picture is presented, if he has watched the patient long enough and studied him carefully enough to exclude leukemia, hemolytic jaundice, polycythemia, and certain other conditions, and if ordinary surgical considerations favor splenectomy he need not hesitate to operate because he believes that the patient has an alcoholic cirrhosis or some other equally definite cause of portal obstruction.

The causative conditions, the treatment, and the results in the forty-seven cases reviewed are shown in the following table.

	Total	Not operated upon	Splenectomy	
			Dead of operation	Not improved
Alcoholic cirrhosis	0	4		
Toxic cirrhosis	0			
Symphietic cirrhosis	3			
Cirrhosis of indeter- mined type	3			
Non-cirrhotic liver ab- normalities	7	3		3
Adhesions				
Congenital heart ab- normality	1			
Proms of the spleen				
Cause unknown				
<b>Total</b>	<b>14</b>	<b>10</b>	<b>4</b>	<b>3</b>
	47	83	7	14

HARVEY F. TAYLOR, M.D.

# GYNECOLOGY

## UTERUS

Shaw, W. F. The Treatment of Genital Prolapse  
*J Obst & Gynec Brit Emp*, 1934, 41 853

Shaw gives a brief review of the anatomy of the pelvis with special emphasis on the uterine supports, the parametrium and the pelvic muscles. He states that prolapse of the pelvic organs is the result of laxity due to weakness or injury of the pelvic muscles and parametrium. Without such laxity, prolapse cannot occur.

Laxity of the muscular tissue about the urethra allows undue dilatation of the urethra with incontinence under strain. Laxity occurring more posteriorly results in cystocele, prolapse of the uterus, and rectocele, all of which are a part of the same condition.

Among secondary conditions which in many cases hasten or determine the occurrence of genital prolapse are increased intra abdominal pressure, increased weight of the uterus pushing that organ down, and increased weight of the cervix pulling the uterus down.

The author discusses the various operative methods of treating prolapse. As the cause of the condition is lack of support of the pelvic floor, an operation which strengthens this support seems rational. Such an operation is colporrhaphy. As a rule both anterior and posterior colporrhaphy are combined with amputation of the cervix. Shaw describes a method which has been used in Manchester by himself and others with slight modifications and excellent results since 1888. Of a series of 664 cases in which it was employed, a complete cure was obtained in 96.38 per cent, and of the cases in which a complete cure was not obtained, the symptoms persisting were severe enough to warrant further operative treatment in only 0.75 per cent. The mortality was only 0.43 per cent.

In 10.3 per cent of the cases the operation failed to cure chronic pain in the lower abdomen and back, and in quite a large number it failed to control incontinence of urine on straining. Only 16.5 per cent of the patients showed any sign of recurrence after parturition. The results were as good in women who had passed the menopause as in young women, and equally good in nulliparæ and multiparæ. The operation does not cause trouble in subsequent labors.

T. FLOYD BELL, M.D.

Naujoks, H., and Hoffmann, H. The Radium Treatment of Benign Genital Hemorrhages  
(Die Radiumbehandlung gutartiger Genitalblutungen) *Zentralbl f Gynaek*, 1934, p. 1922

The authors report the results obtained from intra-uterine radium irradiation in 285 cases of benign

genital hemorrhage treated at the Marburg Clinic. Among these were 252 cases of climacteric and pre-climacteric bleeding, 19 cases of myomatous uterus, 6 cases of submucous myoma, and 8 cases in which the irradiation was done for tuberculous endometritis, blood diseases, juvenile menorrhagia, or sterilization.

The technique was the usual technique except that, for drainage of the uterus during the irradiation, a gauze drain was fixed to the upper end of the radium capsule and led out of the uterus into the vagina.

The disputed question as to whether it is possible to protect the ovaries from irradiation by tamponade of the posterior vault of the vagina or by pulling the uterus down (Jonen) is discussed.

The dosage administered in the reviewed cases was relatively very high (from 2,000 to 3,000 mgm - hrs).

In general, the results were good. Of 213 cases traced, the bleeding was definitely arrested in 207. The remaining 6 cases are discussed in detail. In all of the latter, submucous myomata were found, and in 1 of them the usual cystic glandular hyperplasia of the climacterium was also present. In 1 case of tuberculous endometritis the irradiation was successful, but in another it failed to arrest the bleeding. In the cases of 2 girls thirteen and nineteen years of age respectively who were treated for juvenile bleeding, the bleeding was not controlled although relatively high doses (2,400 and 1,200 mgm - hrs) were used.

In discussing the dangers and complications of the treatment, the authors cite a case of death from embolism. They state that, in general, the climacteric symptoms in the reviewed cases were very mild. Relatively often, however, the patients complained of joint pains (climacteric arthropathy). In the cases of a large number of the patients the radium climacterium lasted for from several weeks to several months, and in the cases of a few, for several years.

The article is concluded with a theoretical discussion of the mode of action of radium irradiation—whether it consists of coagulation of the endometrium or arrest of ovarian function. The authors seem inclined to favor the first theory.

In none of the cases reviewed were carcinomatous changes found later. However, it is erroneous to assume that intra-uterine radium irradiation is an effective prophylaxis against carcinoma of the body of the uterus. This assumption is proved incorrect by cases reported by Kohlanck, Philipp, and Werner in which carcinoma developed later in spite of such irradiation.

(F. SIEGERT) JACOB E. KLEIN, M.D.

Bolaffi, R. Prehypophyseal Hormonaria in Malignant Tumors of the Uterus. Considerations and Researches (Self-hormonaria prehypophyseal tumor maligna dell'utero considerazioni ricerche) *Riv. Ital. di Ginec.* 934, 7 9

The possible influence of the hypophysis cerebri and its hormones on malignant tumors has been the subject of dispute. The author reviews the more important reports of positive and negative clinical and experimental findings.

Bolaffi studied the urine of thirty-nine women with malignant tumors. Thirty-five of the subjects had similar carcinomata of the cervix of the uterus and five had carcinomata of the corpus or the vagina. Five groups of experiments were carried out in the first group, 0.5 ccm of urine were injected into genitalia of the animals studied after forty-eight ccm of urine were made into experimental animals and the results were made into experimental animals. In the second group, repeated injections of urine were made into experimental animals. In the third and fourth groups, massive doses of urine were injected into the experimental animals. In the fifth group, animals were injected with the spinal fluid instead of the urine of the women. In the case of one woman, 0.5 ccm and in the cases of three women, 0.5 or 1 ccm of spinal fluid were injected.

The results showed almost uniformly that a hormone of possibly hypophyseal origin was not demonstrable in the urine studied. The entire series of experiments revealed only three mildly positive results.

A. LORR ROSE, M.D. (Sampson, J. A. The Limitations and Dangers of the Intra Uterine Application of Radium in the Treatment of Carcinoma of the Body of the Uterus. *Am. J. Obs. & Gynec.* 934, 28 783.)

The efficiency of the intra-uterine application of radium in the treatment of carcinoma of the body of the uterus depends upon the following factors: (1) the sensitivity of the entire growth to radium irradiation, (2) the placing of the capsules in the uterine cavity, (3) the dosage, and (4) the proximity of the radium to the growth, especially the invading portions which are at the greatest distance.

From the standpoint of the intimate application of radium to all of the growth, cases of carcinoma of the body of the uterus may be divided into the following three groups:

Those in which the intimate application of radium to all of the carcinoma can be accomplished readily.

Those in which the intimate application of radium to all of the growth is possible, but conditions may render it a matter of chance. Roentgenograms of uteri in which capsules were placed as in the uterus demonstrated that of the intimate application of radium to any or all of the growth may be rendered unsuccessful by faulty technique in the

placing of the capsules, large size of the uterine cavity, a cavity of the "Y" type intramural myomata enlarging the uterine cavity, large polypoid which, like submucous myomata, may deflect the capsules and abate the growth from the radium, and bulky carcinomata filling and distending the uterine cavity like submucous myomata. They showed also that in some cases, in tandem formation, extending from the fundus through the uterine cavity well into the cervical canal, will cover all portions of small uterine cavity except when it is of the "Y" or bicornate type.

Those in which it is impossible to apply uterine radium intimately to all of the growth.

Failure to find carcinoma in check up carcinoma from 5 to ten weeks or even in twice the length of time after radium treatment does not rule out carcinoma in areas not reached by the curies. It sometimes leads to a false sense of security and may be responsible for the patient's death.

In spite of its uncertainties, limitations, and dangers, the intra uterine application of radium is of great value in many cases of carcinoma of the body of the uterus.

Because of the impossibility of determining the exact situation and extent of the growth before treatment and the fact that all of the carcinomata may sometimes be removed surgically in cases in which radium irradiation would be unsuccessful, removal of the ovaries, tubes, and entire uterus with an attempt to prevent the dissemination of the carcinoma is indicated in the cases of patients who are good surgical risks.

The intra-uterine application of radium is indicated in hazardous surgical risks especially when the uterus is small and the adnexa are not enlarged. It is indicated also in cases of carcinomata which are evidently inoperable.

EDWARD L. CORRELL, M.D.

Healy, W. P., and Arneson, A. N. Radiation Treatment of Carcinoma of the Cervix. *Am. J. Roentgenol.* 934, 32 845

Carcinoma of the cervix is now generally recognized as malignant lesion which can be reasonably well controlled in favorable cases by irradiation therapy. As parametrial involvement and pelvic metastases have already occurred in from 75 to 80 per cent of the cases when the patient comes for treatment, the treatment must include the parametrium and pelvis. Radium applied to the cervical region cannot be expected to be effective more than 4 cm from the canal. Therefore external irradiation such as roentgen irradiation is necessary for the more distant pelvic involvement. The authors advocate roentgen irradiation before the application of radium in all but the earliest cases.

Of twenty-six carcinomata reported by the authors, twenty-five were diagnosed histologically as squamous epidermoid cancers and one as an adenocarcinoma. All but one had extended well beyond the cervix. The treatment consisted of roentgen irradiation followed by radium irradiation.

The factors in the roentgen therapy were 200 kv, 30 ma, a 70-cm target-skin distance, filtration with 0.5 mm of copper and 2 mm of aluminum, and 4 fields (2 anterior and 2 posterior) measuring 10 by 15 cm. To each field from 2,000 to 2,400 r were delivered, 200 r being given to an anterior portal and 200 r to a posterior portal on the same side daily. From twenty to thirty days were required to deliver the irradiation. In only 10 per cent was there a rather marked skin reaction indicated by peeling. The constitutional effect was entirely satisfactory. There was little or no bladder or rectal distress.

The roentgen treatments were followed by the application of radium to the cervical lesion for approximately 1,500 mc-hrs with filtration by 2 mm of brass. Immediately following this application, two radon capsules with filtration by 0.5 mm of gold and 2 mm of black rubber were placed in the cervical and uterine canals for 3,000 mc-hrs.

Biopsies were done during the course of the treatments. From three to six weeks were required for complete primary healing of the cervical lesions by roentgen therapy. Healing was more prompt when the higher dosage was employed. Of interest was the fact that even in the presence of clinical evidence of cure, biopsies were positive in the cases of patients who had not yet received radium treatment. The blood-vessel changes and fibrosis remained. Histological studies in a control case in which 700 r were given to 4 fields revealed more rapid changes, but less change in the tumor bed. Primary healing did not occur and specimens taken two weeks after the beginning of the treatment showed evidence of multiplying resistant cells.

Since regression of the lesion was evident clinically and histologically, the authors believe that regression might reasonably be expected in the region of the parametrium. However, radium should be employed in the treatment of the primary lesion, and in cases of very early lesions should be used before the roentgen-ray cycle.

EARL E. BARTH, M.D.

#### ADNEXAL AND PERIUTERINE CONDITIONS

Novak, E., and Brawner, J. N., Jr. Granulosa-Cell Tumors of the Ovary. *Am. J. Obst. & Gynec.*, 1934, 28, 637.

This article is based on thirty-six cases of granulosa cell tumor of the ovary. The authors discuss the anatomy, histogenesis, and types of granulosa-cell tumors in detail.

Five of the cases reviewed were those of children under the age of puberty. In all of these there were manifestations of precocious puberty. Menstruation occurred in all except one. Only six of the patients were definitely beyond the menopause, but ten others were in the fifth decade of life.

When the tumors occur before puberty they usually cause precocious menstruation. When they occur during reproductive life they bring about disturbances analogous to those characteristic of hyperplasia of the endometrium (menstrual excess

with amenorrhoea at times). When they occur after the menopause they tend to produce a menstrual or pseudo-menstrual type of bleeding.

A stimulating effect of the tumor on the structure and function of the breasts is noted. In children under the age of puberty and in women beyond the menopause striking effects on the secondary sex characteristics are apparent. The special histological effects of these tumors are due to the fact that they secrete folliculin and, in some cases, also progesterin.

While it has been rather generally agreed that the malignancy of granulosa-cell carcinoma is much less than that of ovarian cancers in general, the authors are of the opinion that it is considerably greater than is generally believed. In the reported cases which were adequately followed up, the incidence of clinical malignancy was 28.1 per cent.

As a rule the tumor can be readily demonstrated by manual or abdominal examination, and in many cases it is noted by the patient herself. In women during the reproductive period of life the granulosa nature of the neoplasm is usually not suspected until operation is performed and sometimes not even then.

The treatment of granulosa-cell tumors is essentially surgical. For the present it seems best to restrict radiotherapy to inoperable or recurrent tumors or to give it before or after operation in cases of tumors that are surgically removable.

EDWARD L. CORNELL, M.D.

#### EXTERNAL GENITALIA

Mercier, O. Personal Technique for the Cure of Epispadias in Women. *Brit. J. Urol.*, 1934, 6, 313.

Mercier reports the case of a girl seventeen years of age who had suffered from incontinence of urine since birth. Examination showed that the urethra opened behind the symphysis and was only  $\frac{1}{6}$  in long. The labia majora, the labia minora, and the clitoris were separated by a furrow. On each side of the furrow, at the end of the labia minora, there was a stump which appeared to be the vestige of an incompletely formed sphincter. X-ray examination disclosed no separation of the pubic bones.

The operation performed was a combination of procedures. It elongated and narrowed the urethra and restored the external sphincter. The technique was a modification of that used by Marion. To elongate the incomplete urethra, a flap was dissected from the anterior wall of the vagina and each side of the flap was fixed to the corresponding side of the furrow. Thus the internal part of the new canal was formed of the vaginal mucosa. After the new urethra was shaped, the lateral stumps which seemed parts of an incomplete sphincter were sutured together in the median line as would be done for the cure of cystocele. The lateral dissection was deeper and the sutures were placed as far as possible on each side. The operation was completed by reconstruction of the labia and clitoris. The bladder was then drained by means of a cystostomy. No catheter was placed

## INTERNATIONAL ABSTRACT OF SURGERY

In the new canal before the fifteenth day. On that day the cystostomy tube was removed and a soft catheter was introduced into the new urethra and left until the suprapubic wound had healed completely. Within three weeks after the operation the patient was able to urinate normally and to hold her urine perfectly. There was no nocturia.

HARRY W. FINE, M.D.

## MISCELLANEOUS

Twinn, R. G. *Thermo-Electrical Researches in Obstetrics and Gynecology* (Researches on electrical and caloric obstetrics gynecological) *Am. J. Phys.* 934, 7

The author reports studies in which he used the electrical method of Benedict to determine the surface temperature of the body. He describes the method and discusses its advantages. The measurements were made at about 35 standard points which are shown by diagrams.

Determinations in the cases of 80 women showed that under physiological conditions the cutaneous temperature varies from 30 to 34 degrees. This variation seems to be dependent upon the subject's general condition and the condition of the sympathetic system. Normally there are warm and cold spots on the surface of the body. The warm points are found chiefly on the head and trunk, and the cold points on the extremities.

Fluctuations in the cutaneous temperature are evidenced during different stages of the menstrual cycle. In the cases of 70 normal women the temperature determinations were made 4 times a day. They showed that, in general, there is moderate elevation of the temperature during the second intermenstrual stage which usually reaches its maximum the week before the occurrence of menstruation and then returns to a level which remains constant in the postmenstrual and first premenstrual stages. The average difference between the highest and lowest levels varied from 4 to 7 degrees. The maximum elevation occurred in the abdominal and axillary regions. In few instances the variation was as from 5 to 8 degrees.

In a similar study of 900 women in various stages of pregnancy it was found that the cutaneous temperature is lower during the first half than during the second half of pregnancy. Whereas in the early stages of pregnancy the mean temperature approximates the lower limits of normal, in the last months it tends to approximate the upper limits of normal and becomes higher as term is approached. There are certain zones of hyperthermia, notably the abdomen. Measurements at points in the breasts showed constantly higher temperatures in pregnant women than in non-pregnant women. Just before and during labor there is a further rise in the temperature. In the puerperium there is a gradual increase during the first twelve hours which is followed by a gradual decrease in the second twelve hours and then by a progressive rise until the second or third

day of the puerperium. From the third to the eighth day there is a gradual decrease and the normal level is reached.

Studies of 80 women with uterine fibromyomata revealed no variations from the normal. In studies of 40 women with carcinoma of the uterus it was found that the temperature in this condition is usually within the normal limits but in small areas of skin on the lower abdomen corresponding to the uterus and adnexa it may be slightly increased.

In the cases of 33 women with ovarian cysts the temperatures were normal.

In the cases of 54 women with inflammations of the pelvis and adnexa quite marked hyperthermia was found. The portions of skin corresponding to the inflamed viscera were warmer than the skin of other parts of the abdomen by an average of from 1.45 to .78 degrees.

Studies of the extremities of 6 women with thrombophlebitis showed that the involved extremity was on an average from 2 to 3 degrees warmer than the opposite normal extremity from the beginning of the subjective symptoms and even before the objective signs were manifest.

In a study of 85 newborn infants weighing at least 500 gm. the minimum cutaneous temperature was 30.8 degrees and the maximum 33.78 degrees. An average temperature of 33.5 degrees was common during the first and second days of life. The temperature tends to fall, but the decrease is less than normal which is followed by a gradual return.

In a study of 85 newborn infants weighing at least 500 gm. the temperature was found to be lower than in full-term infants, averaging from 28 to 32 degrees. It varied like that of full-term infants.

Studies of the vaginal temperature were made in the cases of 3 normal women. The average variation is between 35° and 37.6 degrees. The variations during the menstrual cycle correspond to the changes in the cutaneous temperature. In pregnancy there is practically no change in the vaginal temperature until about the eighth month. Variations then occur. In women with carcinoma of the uterus the vaginal temperature averaged about 37.95 degrees. In 8 women with tubal pregnancy it was slightly increased.

A. LOUIS ROSE, M.D.

Wiemer, R. P. *The Postnatal Development of the Genital Organs in the Albino Rat*. *J. Biol. & Chem.* 934, 41, 807

Wiemer reports experiments carried out on rats to determine the factors influencing prepubertal sex differentiation, discusses the di-hormonal theories of cycles to explain certain anomalies.

The experiments carried out on male rats showed that castration interfered with both the growth and the differentiation of the glands penis. The effects

became noticeable within a week, and the differences between normal and castrated males increased with age. Apart from the reduction of the growth rate and growth limit, the most obvious effects of castration were (1) complete absence of the anterior process which, in the male, is formed during the first week of life, (2) incomplete differentiation followed by partial de-differentiation of the corpus cavernosum glands, and (3) incomplete differentiation of the integument.

The seminal vesicles depend for their growth and differentiation on the testicles. While the testicular secretion is necessary for the normal development of the sex organs in the rat, this may not be true in other species.

The effects of castration in the male can be largely neutralized by injections of androkinin.

The author describes the normal prepubertal development of the uterus and vagina of the rat in detail.

In his experiments the animals subjected to complete oophorectomy soon after birth continued their development. It is therefore evident that, in the female, the gonad is not required for prepubertal development, and it appears that somatic, and not gonadic, factors are responsible for early genital development.

In the female it is necessary to distinguish between two phases of extra-uterine genital development. The first phase is represented by infancy, during which differentiation of the genital organs is completed, and the second phase by puberty, when the effect of ovarian hormone becomes manifest.

In the reported experiments, the administration of thylinin to newborn female rats failed to produce acceleration of differentiation or pronounced growth.

T FLOYD BELL, M D

**Butenandt, A.** Recent Progress in the Study of Sex Hormones (Neuere Ergebnisse auf dem Gebiet der Sexualhormone) *Wien klin Wchnschr* 1934, 2 897

This article is a review of what is known with considerable certainty to date regarding the physiology and chemistry of the sex hormones. The number of the hormones involved in the regulation of the normal sexual processes and the sites of their formation have not yet been determined beyond dispute. At the present time only the hormones which act directly on the primary and secondary sex organs are called sex hormones. In contrast to the specific hormones of the female and male sex glands the gonadotropic hormones are characterized as sexually non specific. That the gonadotropic factors are true substances has been proved by experiments with extracts of the anterior lobe of the hypophysis.

The author rejects the theory that the gonadotropic hormones act as a motor for sexual function in the sense that puberty, menstruation, and the functions of the sex glands are initiated only through the production of such hormones. He believes it

possible that an accessory factor (likewise formed in the hypophysis) is necessary, that the combined action of this factor and the gonadotropic hormones induces puberty and its failure induces the climacterium.

The problem as to the number of gonadotropic hormones is still unsolved. As the chemical study of the hypophysis is not yet completed, it appears likely that this question can be answered only after the effective gonadotropic substance has been chemically isolated in pure form. The highest degree of chemical purity thus far attained presents no grounds for separation of the hormone into Prolan A and Prolan B. It appears that, during pregnancy, the gonadotropic hormones are formed in the placenta.

The male sex hormone was first isolated in a chemically pure crystalline form (androsteron) by Butenandt and Tscherning. Further studies are necessary to determine whether it consists of one or several sex hormones.

The follicular hormone has been isolated as a chemically simple substance in crystalline form by Butenandt, Doisy, Marrian, Laqueur, Collip, Jacobi, and others from the urine of pregnant women, the urine of the mare, the placenta, and even palm seeds. Strangely enough, it always occurs in association with the male sex hormone. It is described as a growth-producing substance with a special influence on the female genital tract.

According to Butenandt, the hormone produced by the corpus luteum has been definitely recognized thus far only through its well-known effect on the proliferating uterine mucosa.

The interaction of the sex hormones through the interaction of the mid-brain, the hypophysis, the sex glands, and the uterus is explained with the aid of a table from the work of Schoeller. The influence of the sex hormones on the cyclic change in the uterine mucosa through the successive action of the follicular and the corpus-luteum hormones seems to have been definitely proved. To produce the picture of a menstrual cycle in the uterus of a castrated woman from 250,000 to 300,000 mouse units of follicular hormone and from 30 to 50 rabbit units of corpus-luteum hormone are necessary. However, this amount only seems to be large as 1,000,000 units of follicular hormone correspond to 20 mgm of the crystalline follicular hormone. One-tenth  $\gamma$  of a standard preparation preserved in London is equal to 1 international unit of follicular hormone. Chemical purification of the follicular hormone renders possible exact dosage by weight.

In the determination of the chemical formula of androsteron and the follicular hormone considerable progress has been made. The follicular hormone is so closely related to androsteron that it appears possible to transform androsteron into the follicular hormone by dehydration and splitting off an atom of carbon. Both hormones belong to the class of sterans. In dehydrated androsteron a substance intermediate between the female and the male

## INTERNATIONAL ABSTRACT OF SURGERY

hormones has been found. Butenandt considers it possible that the action of these hormones might be increased by a slight change in the structure of their chemical formulae. He believes it possible also that they may be produced synthetically and their cost thereby considerably reduced.

The chemical study of the corpus-luteum hormone is still in its initial stages. Butenandt believes that he is the first to have obtained a chemically simple, crystalline substance with the effect of the corpus-luteum hormone. The chemical structure of this substance suggests a close relationship between the corpus-luteum hormone and the other sex-gland hormones. (II SEMINAR) JOHN W. BRYANT, M.D.

Donaddu F. P. The Influence of Thyrectomy on Genetic Activity and the Offspring (L'influenza della tiroidectomia sulla attività genetica sulla prole) *Riv. ital. di fisiol.* 934, 8

The author reports his experimental studies regarding the relationship of the thyroid gland to genetic activity especially in the female. In one group of male rabbits and one group of female rabbits thyrectomy was done prior to the age of puberty and in two corresponding groups it

was done after maturity. The animals were then mated in all possible combinations with each other and with normal bucks and does. The offspring and their young in turn were treated similarly. In this way the author was able to study the effect of thyrectomy on genetic activity of five consecutive generations of rabbits (ninety-eight animals). His findings are summarized as follows:

1. The genetic activity of the rabbits was greatly altered following thyrectomy particularly when the operation was performed before the age of puberty.
2. Fecundation was deficient or impossible when both mating animals were thyrectomized.
3. Fecundation of thyrectomized rabbits or when thyrectomized descendants was possible only when these rabbits were mated with normal animals.
4. The newborn of thyrectomized rabbits weighed less at birth than those of the controls, but in the first few days of life to parallel that of the controls.
5. The psychic development, immediate as well as remote of the offspring of thyrectomized rabbits was entirely equal to that of the normal controls.

GROVER C. FROES, M.D.

# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

Davy, L., and Sevringhaus, E. L. Analysis of Errors Inherent in Pregnancy Tests Based on the Aschheim-Zondek Reaction *Am J Obst & Gynec*, 1934, 28 888

Of 425 cases in which tests for pregnancy were made by methods based on the Aschheim-Zondek reaction, the diagnosis was accurate in more than 90 per cent. Three modifications were employed either as individual methods or as concurrent tests with interpretation of the results as a single test.

Erroneous diagnoses due to limitations inherent in the methods were made in 8 per cent. Such systematic errors occurred in 3.92 per cent of the cases of pregnancy. Two were made in cases of very early pregnancy in which the test was positive later. In early pregnancies more consistently accurate results were obtained by a modification of the Friedman rabbit test or by an immature female rat test than by the Schneider immature rabbit test. Incorrect negatives were obtained in 9 pregnancies of more than one month's duration. In 7 of these there was definite fetal or maternal abnormality, in 1 there was no known abnormality, and in 1 the history was not reliable.

Faulty tests made in 12.7 per cent of the cases in which pregnancy was absent may be classed as systematic errors. Many of the cases with a false positive test can be correlated with known gynecological problems in which there are demonstrable endocrine disturbances. Each of the cases testing incorrectly positive was studied from the standpoint of the clinical features manifested before and after the test and with respect to the ovarian picture in the injected animals. Correlation of the laboratory and clinical findings suggested that ovarian dysfunction in the absence of pregnancy can be differentiated from pregnancy by the concurrent application of 2 or more tests to the urine. In cases of this type false positives have not occurred with the use of either the Schneider immature rabbit or the immature female rat as the test animal. The more highly sensitive Friedman rabbit is of value for the demonstration of gonad-stimulating substance in the urine of non pregnant women.

EDWARD L. CORNELL, M.D.

Astrinsky and Grinner. Gonorrhœa and Pregnancy (Blenorrhagie et grossesse). *Gynec et obst*, 1934, 30 430

The authors report their observations in 142 cases of gonorrhœa in women seen over a period of from two to five years. In 135 of these cases bacteriological proof of gonorrhœal infection was obtained. In 7, the diagnosis was made clinically. During the

period of observation, 121 of the women had 1 pregnancy, 18 had 2 pregnancies, and 3 had 3 pregnancies.

In order to study the effect of gonorrhœa on fertility, conception pregnancy, and the puerperium, the authors divide the women into 3 groups as follows:

Group 1, 45 women who conceived when infected. Among these were 41 with involvement of only the lower genital tract and 4 with ascending infection of long duration.

Group 2, 52 women who became infected during pregnancy, including 21 who were infected during the first half and 31 who were infected during the second half of pregnancy.

Group 3, 45 women who conceived after recovery from the infection, including 28 with involvement of only the lower genital tract and 17 with involvement of the adnexa.

From their observations in these cases the authors conclude that gonorrhœal infection of the cervix and adnexa does not exclude the possibility of conception. Pregnancy is capable of activating latent gonorrhœal infection. Involvement of the internal genitalia, vagina, and cervix during pregnancy is accompanied by more intense clinical symptoms than gonorrhœal infection in the absence of pregnancy. The incidence of complications during pregnancy or the puerperium is highest when conception occurs in the presence of, or following ascending gonorrhœal infection. The chief complications are early abortion and postpartum hæmorrhage. The presence of gonococci in the lochia is not necessarily accompanied by fever.

Puerperal disorders occurred in 11.5 per cent of the cases reviewed. In 7 per cent of the latter they occurred early, and in 4.5 per cent late, in the puerperium. The incidence of puerperal complications was highest (46 per cent) in cases in which the infection occurred during the second half of pregnancy. In 67 per cent of such cases the gonococcus could be demonstrated. Induced abortion accounted for 30.2 per cent of the puerperal complications. The authors believe that to prevent ascending infection following delivery or abortion, it is necessary to obtain an abundant lochial discharge.

The diagnosis of gonorrhœa during pregnancy and the puerperium is made in the same way as in the absence of pregnancy. As a supplementary diagnostic procedure it is desirable to make a bacteriological examination of secretions adherent to the suprapubic ridges of the infant.

The treatment of gonorrhœa during pregnancy requires the use of the entire therapeutic armamentarium with due regard for the pregnancy. Vaccination is indicated for both the treatment and the



prophylaxis of puerperal infection. Crede a method of prophylaxis does not exclude the possibility of infection elsewhere, as in the breast. To discover the presence of the gonococcus during pregnancy it is necessary to use modern methods of investigation in all gynecological and obstetrical examinations. The close cooperation of all maternal welfare and venereal clinics is necessary if the fight against gonorrhea during pregnancy is to be successful. Effective prophylaxis requires education of the public.

HAROLD C. MACE, M.D.

Stander, H. J., and Cadden, J. F.: Blood Chemistry in Pre-Eclampsia and Eclampsia. *Am J Obst & Gynec* 93:4, 8, 356

Pre-eclampsia and eclampsia are regarded as the same disease. Frequently repeated chemical studies of the blood in the cases of 108 women with eclampsia and 40 with pre-eclampsia showed that the chemical character of the blood is an important factor in the severity of the disease and of the treatment needed.

The non-protein nitrogen content of the blood remains within normal limits in eclampsia and pre-eclampsia except when involvement of the kidneys late in the disease causes it to increase. The blood urea nitrogen remains low as in normal pregnancy. The ratio between urea nitrogen and non-protein nitrogen is about 4, as compared with 5 in normal non-pregnant women.

The uric acid of the blood shows an increase in eclampsia and pre-eclampsia, indicating a disturbance in its destruction in the liver. The uric acid content of the blood may be regarded as a fairly reliable index of the severity of the disease.

The blood sugar is not greatly disturbed, but occasionally an eclamptic convulsion is followed by a definite hyperglycemia. This may be due to muscular activity.

The alkali reserve is often greatly decreased, sometimes even to the level of true acidosis. The carbon dioxide combining power is the most reliable and most easily determined index of the necessity of treatment for acidosis.

The blood chlorides are not markedly decreased except in an occasional case with marked edema. The thionine content of the blood remains within normal limits.

The glutathione content also remains normal except in patients with low blood hemoglobin readings. The increase in the uric acid of the blood in eclampsia and pre-eclampsia cannot be accounted for by an increase in thionine. The hyperglycemia sometimes observed in the convulsive stage of eclampsia appears to be a true hyperglycemia and not due to glutathione or thionine.

EDWARD L. CORNWELL, M.D.

Emge, L. A.: The Influence of Pregnancy on Tumor Growth. *Am J Obst & Gynec* 93:4, 55, 66

In the investigation reported, Emge studied the growth behavior during pregnancy of adenofibro-

mas, fibromas, and fibrosarcomas originally derived from a spontaneous adenofibroma in female white rats. The tumors developed by these animals appear as single tumors and, because of their steady and uniform growth, are especially suitable for such studies. The fibrous sarcoma is a typical of many that recur rapidly after removal. This is typical of many of the experimental studies of the white rat. From studies that the growth rate of benign and malignant tumors, although responsive to the general systemic influence of pregnancy as expressed by cytological changes, is not influenced beyond variations in individual growth tendencies.

The behavior of neoplastic tissue during pregnancy is dependent upon a complex set of factors. Experimental evidence strongly supports the belief that neoplastic tissues possesses definite and inherent growth tendencies which are controlled by a protective mechanism peculiar to body economy. Therefore, regardless of the type of the tumor the growth rate depends upon a certain balance between these two factors. A disturbance of the balance will be manifested by either an acceleration or a retardation of the growth tendencies of the neoplastic tissue. A given neoplasm is therefore necessary for a correct interpretation of the growth rate of that tumor during pregnancy.

From clinical and experimental observations Emge draws the following conclusions:

1. The influence of pregnancy on the behavior of neoplastic tissue depends upon a complex set of factors.

The growth rate of neoplasms is inherent, but the controlling mechanism is still unknown. Clinical evidence suggests that pregnancy favors protective mechanisms against tumor growth.

2. Neoplastic tissue takes part in the local and remote reactions incident to pregnancy the ultimate result depending upon the length of the gestational period. These changes are of temporary nature. The extent of favoring of benign neoplasms depends upon the relation of the neoplasms to the generative organs, particularly the uterus.

3. Neoplastic tissue sensitive to hormonal stimuli may exhibit increased activity during pregnancy.

4. Physical changes in benign tumors during gestation are not necessarily expressions of growth activity.

5. It is not proved that pregnancy favors the inception of malignancy or the malignant degeneration of benign tumors.

6. Experimental evidence substantiates clinical findings in general and permits the conclusion that pregnancy as a rule does not influence the growth rate or the size of neoplasms beyond certain variations, the most frequent of which is retardation. In many instances the growth rate remains unaffected. Only occasionally is an acceleration observed. At the termination of gestation neoplasms assume their primary growth rate.

EDWARD L. CORNWELL, M.D.

## LABOR AND ITS COMPLICATIONS

Caldwell, W. E., Moloy, H. C., and D'Esopo, D. A.  
A Roentgenological Study of the Mechanism  
of Engagement of the Fetal Head. *Am J Obst*  
& Gynec, 1934, 28: 824

Roentgen examination with the use of the precision stereoscope constitutes a distinct refinement in obstetrical diagnosis during labor. This method is rapid, accurate, and practical. In all cases of atypical labor a roentgenological examination should be made before operative interference is undertaken.

The authors present statistics on positions of the fetal head at the inlet in relation to the type of pelvis.

Positions at the inlet may be divided into three groups: (1) primary posterior positions, (2) primary transverse positions, and (3) primary anterior positions, including the direct occiput anterior position.

The transverse parietal position is the common position at the onset of labor.

The engagement of the fetal head is described. This is the reverse of the principle known as "synclitism" which heretofore was regarded as the common method of engagement.

Posterior rotation is assisted by the angle assumed by the fetal axis along the slope of the uterine wall toward the inclined inlet. The uterine contractions impart a spiral movement to the body along these two inclined planes, and rotation takes place forward along the line of least resistance.

The attitude of the fetus at rest and the changes secondary to the onset of labor are described.

EDWARD L. CORNELL, M.D.

## PUERPERIUM AND ITS COMPLICATIONS

Salvini, A. A Contribution to the Clinical Study and Therapy of Late Puerperal Haemorrhage (Contributo alla clinica e alla terapia delle emorragie tardive del puerperio). *Riv Ital di ginec*, 1934, 17: 238

The most important complications in the six week puerperal period are infection and haemorrhage. The exact time in the puerperium at which haemorrhage may be classified as late has not been determined definitely. The term "late" has been used in the literature for haemorrhages occurring at any time between the first day and the end of two weeks.

Among the causes of late puerperal haemorrhage are: (1) the retention of fragments of placenta with the subsequent formation of so called placental polypi consisting of more or less modified placental tissue covered with coagulated blood and usually pedunculated but sometimes having a broad base, (2) the retention of fragments of decidua as the result of separation of the placenta in a false plane, (3) local uterine infection, (4) secondary atony of the uterus, (5) malignant tumors, (6) fibromata or fibromyomata, (7) unrecognized lacerations in the lower uterine segment, (8) vaginal ulcerations, (9) disease of the blood vessels, and (10) systemic

diseases, including blood dyscrasias and other conditions. Of these, the first three are by far the most common and important.

The author reviews the clinical records of fifteen cases of late puerperal haemorrhage. Seven of the women were primiparae. In twelve cases labor was spontaneous, in two cases, forceps were applied, and in one case, version was done. The time of appearance of the haemorrhage ranged from seven to thirty days after delivery. In all of the cases the haemorrhage endangered life. In eleven, the cause was retention of placental tissue. In two of these the placenta had begun to undergo putrefactive changes. In two cases the haemorrhage was due to subinvolution of the uterus, in one case to retention of decidua in the stage of hyaline degeneration, and in one case to a septicopyemia.

The author reviews the literature on methods of treatment. He emphasizes the importance of preventing late puerperal haemorrhages by correct management of labor and the early puerperium and immediate revision of the uterine cavity when the expelled placenta appears to be incomplete. He believes that in cases of retention of placental tissue in which the tissue is very lightly attached to the uterine wall and the cervix is dilated, it is best to remove the residuum even in the presence of fever. This must be done with minimal trauma. If the curettage is negative, medical therapy should be instituted. If haemorrhage then does not cease or is repeated, and especially if the temperature tends to remain elevated, abdominal hysterectomy should be done before the general condition becomes too serious.

A. LOUIS ROSI, M.D.

Watson, B. P. Practical Measures in the Prevention and Treatment of Puerperal Sepsis. *J Am M Ass*, 1934, 103: 1745

In exogenous infection of the uterus the most common invading organism is the streptococcus and the most virulent streptococcus is the haemolytic streptococcus. The organisms are introduced directly by the hands or enter the body by way of nasal and throat infection. Of importance in the prevention of such infection are asepsis during vaginal examinations and delivery, the prevention of contact between the patient and a carrier, the use of masks and the isolation of cases of infection. Without proper control and without the proper structural arrangement, an obstetrical hospital may be less safe for delivery than even the poorest home.

The vagina of every pregnant woman and of every woman in labor contains organisms which ascend into the cervix and lower uterine segment in the later stages of labor and the early puerperium. The normal puerperal uterine cavity is heavily invaded by the third day after delivery and does not become sterile until the tenth or twelfth day. Most of the organisms are not pathogens. Under certain circumstances, however, the pathogens present become virulent and cause infection. The prevention of such an occurrence requires elimina-

tion of the organisms from the genital tract and the avoidance of conditions rendering them virulent.

The results of the treatment of puerperal infection depend chiefly on the virulence and invasiveness of the infecting organisms and to a lesser extent on the tissue reaction and the patient's resistance. In the author's management of cases of puerperal infection the patient is isolated, a thorough physical examination is made, an ice pack is applied to the abdomen, 5 gr. of quinine sulphate and a small enema are administered daily and a light but nourishing diet is given. No pelvic examination is made other than inspection of any perineal lacerations that may have occurred and the removal of a culture from within the vaginal introitus. The uterus is not manipulated from the abdomen. The uterus is not

Persistence of fever is due to (1) persistence of the infection in the uterus, (2) extension of the infection to the pelvic cellular tissue, (3) extension of the infection to the pelvic veins (septic thrombophlebitis) or (4) invasion of the blood stream. In the author's treatment of cases (septic thrombophlebitis) transfusion of 500 cc. of blood is given and may be repeated every three or four days.

Thrombophlebitis is manifested by costovertebral tenderness, a fluctuating temperature, a high leucocyte count, and chills. In cases in which an embolus is formed, marked dyspnea and orthopnea occur. In severe cases, the use of an oxygen tank is necessary.

The operative treatment of puerperal infection is limited. The author opens pelvic abscess, but does not explore massive cellulitic exudates until there is definite evidence of softness and fluctuation. If states that most cellulitic exudates become absorbed without suppuration.

J THOMAS WILL WHITESIDE, M.D.

Serdoukoff M. O. The Modern Management of Puerperal Fever (*La thérapeutique actuelle de la fièvre puerpérale*). *Gynécologie* 914-33 6

In spite of greater facilities for adequate obstetrical care in Russia, the sixteenth anniversary of the Revolution shows high incidence of puerperal infection. Moreover there is no single therapeutic measure which provides a sure and constantly effective weapon against the condition. The mortality ranges from 5 to 8 per cent. At Moscow in 93 it was 5 per cent. At Moscow in 95 during an epidemic of 3.7 per cent. Since from 15 to 8 per cent of those who die are young women who were previously in good health, puerperal fever is an important factor in the national infection. The great variety of localities of postpartum infection proves the necessity of increasing efforts to overcome the menace and establish standard methods of treatment. The mortality of puerperitis ranges from 95 to 100 per cent that of septicaemia is 7 per cent and that of pelvic infections may be as high as 10 per cent. The author discusses the etiology and pathology of puerperal septicemia emphasizing that pre-

vention (the avoidance of trauma, to the tissues, strict asepsis) is the most important approach toward the elimination of the exogenous types. The autogenous variety thrives in the presence of lowered resistance (especially after hemorrhage). The exact diagnosis of autogenous infection is not always possible. In epidemics, seasonal factors play a part. Epidemics are most common in autumn and winter when atmospheric pressure is low and humidity is minimal. The period of incubation of the disease is variable, ranging from twelve hours to twelve days after abortion or delivery. It is closely related to the organic resistance and the state of the reticulo endothelial and nervous systems as well as to the virulence of the invading micro-organisms. Under normal conditions, local tissue immunity such as is characteristic of the ovary may play protective rôle.

Exact diagnosis by clinical, bacteriological, and biological methods must precede any attempt at treatment. The fixation abscess of Fauschier (Philippe-Roger reaction) is of prognostic value. Failure of the fixation becomes indicative of the body to react, the presence of a severe infection, and as a rule a fatal outcome. However the Philippe-Roger reaction must not be relied upon too implicitly as during the course of an infection various ideas as to the state of the organism and the functional state of the blood at the given moment. One of the best indications of the prognosis is the hemogram. The author has found that an average leucocyte count of 5,000 is favorable sign. A shift to the right (Schilling) i.e. decrease in the hemoglobin, leucopenia, monocytosis, and lymphopenia, indicates an unfavorable prognosis. Clinical findings indicating an unfavorable prognosis are an increasing acidosis and a falling blood pressure.

The management of puerperal infections involves (1) prophylaxis, (2) protection of the organism against infections, (3) destruction of the bacteria already present if time permits, and (4) stimulation of the organic resistance to infection. The organic resistance to infection may be increased by:

Shock, therapy consisting of the intravenous administration of some form of protein or some other substance. The injection of from 10 to 100 gm. of 1 to 2 per cent solution of calcium chloride in distilled water or a 50 per cent solution of silver nitrate in alcohol usually causes intense shock by producing necrosis at various points of the vascular endothelium with the liberation of albuminoids and colicoids which agglutinate and neutralize bacteria. If shock fails to occur the prognosis is poor as the sympathetic nervous system is affected by the toxins and blockage of the reticulo-endothelial system has taken place. In the cases of patients in poor condition, shock treatment should be given with caution. In cases of endocarditis, septicæmia, and metastatic pneumonia shock treatment is contraindicated.

2 Immunization by the administration of streptococcus, staphylococcus, diplococcus, or polyvalent sera. The author combines the administration of urotropin with serotherapy at two-day intervals as experiments on animals have demonstrated that urotropin agglutinates and neutralizes endotoxins. Vaccines are employed only in chronic cases or cases of low grade infection. Serdukoff prefers autogenous vaccines.

3 Stimulation therapy (Reiztherapie). Serdukoff prefers autohemotherapy combined with the administration of urotropin.

The specific treatment outlined by the author is as follows:

1 Severe forms (a) intravenous injection of alcohol, umbilical cord serum, (b) repeated small blood transfusions, (c) roentgen therapy, (d) the fixation abscess of Fochier.

2 Moderately severe forms (a) the intravenous injection of a 1 per cent solution of calcium chloride, distilled water, a solution of silver nitrate, (b) the intravenous injection of urotropin, (c) the use of methylene blue and calomel, (d) umbilical cord serum, normal horse serum, polyvalent serum injected subcutaneously, (e) blood transfusion, autohemotherapy, fixation abscess.

3 Low grade infections: urotropin injected intravenously, umbilical cord serum, horse serum, blood transfusion, autovaccination, incision and drainage of abscesses.

Serdukoff admits that this scheme of treatment suggests polypragmatism, but states that an experience of eighteen years has proved it to be of value. He emphasizes the importance of differentiating between acute, subacute, and chronic cases in the selection of the treatment. All possible precautions must be taken to avoid destroying the natural defense mechanisms. Bed rest is essential. Serdukoff emphasizes especially his method of administering umbilical cord serum (seroplacenta).

which is said to contain large quantities of electrolytes, natural antigens, and hormones.

HAROLD C. MACK, M.D.

Schlink, H. H. The Treatment of Surgical Injuries Following Childbirth. *Med J Australia*, 1934, 2: 707.

The author reviews the anatomy of the pelvic floor and describes the operations for the repair of surgical injuries following childbirth which he regards as the methods of choice.

He believes that in the repair of the lacerated perineum the factor of chief importance is union of the levatores ani, particularly their pubococcygeal fibers. He describes the method which he uses for exposure of these muscles and their union in the midline between the rectum and vagina. His method is the simplest and most direct possible. In repair of the ruptured sphincter ani, he follows the same steps with the addition of sufficient exposure of the ends of the retracted sphincter and their union by means of a fine chromic catgut suture and several plain gut sutures. He emphasizes that union of the levatores need not be carried very far up to secure a good physiological result.

For the correction of retrodisplacement of the uterus, Schlink rejects all methods except those which have as their basis the shortening and fixation of the round ligaments. Of the latter, he uses only those in which the stronger uterine ends are employed for support. His choice of operations is (1) the Alexander-Adams operation, (2) the Alexander laparotomy, and (3) the Gilliam-Bonney operation.

For the correction of prolapse of the uterus, Schlink prefers the Donald-Fothergill operation. He describes this operation in detail. When removal of the uterus is indicated by some condition other than the prolapse alone, he prefers the Goffe-Mayo operation.

HENRY S. ACKEN, JR., M.D.

# GENITO-URINARY SURGERY

## ADRENAL, KIDNEY AND URETER

Ragnotti E.: Considerations and Researches on the Pathological Significance and the Experimental Production of "Dynamic Hydro-nephrosis" (Consideratione ricerche ed significato patologico della produzione sperimentale della "idronefrosi dinamica") Arch Med. e chir. 934 35 307

In the study of the renal pelvis and ureter the motor functions of these structures were obvious from the very first. At the beginning of this century several investigators recognized a type of hydro-nephrosis without apparent cause which they called "dynamic." It was soon realized that the nervous system might play an important rôle in this disorder. That neurogenic factors may manifest themselves by urinary obstruction is well known. Neuro-genic changes in the function of the renal pelvis and ureter may be in the direction of hypertonia and spasm or atony, both of which may lead to dilatation of the pelvis. However such pure clinical forms of functional disturbance are rare.

The author reviews the literature on hydronephrosis and on the neuro-anatomy especially the sympathetic system, of the ureter and renal pelvis. Because of the great uncertainty as to whether ureteral atony is primarily myogenic or neuro-genic, he undertook experimental studies to determine the nature of the changes in the motor function of the ureter produced by partial destruction of the intrinsic ureteral nervous system, what changes in function have purely neurogenic basis, and what changes result from morphological alterations.

He found that the optimum tension or pressure in the ureter for the maintenance of peristaltic movements varies from 3 to 5 cm. of water. Above these levels fatigue results rapidly. Enervation of the ureter produced mechanically or chemically is followed by changes especially in peristalsis, but the peristaltic movements tend to persist, indicating that the musculature retains its automaticity and potential contractility.

In his studies of the morphological changes in the ureter and their results, Ragnotti found that dis-cularis is bared or remains covered by only a thin loose connective tissue may result later in sclerotic which may change the ureter by disorgan-izing and infiltrating the muscularis or replacing the connective tissue. As consequence normal contractions cannot occur in the involved region if action is impaired, and retention of urine with dilatation result. When the mechanical changes are less extensive and only the nerves are involved, the changes of function are mild and no morpho-

logical changes result. Obstruction caused by trauma is therefore mechanodynamic and does fundamentally to sclerotic stenosis or sagittation. Although the automatic movements of the muscles of the ureter persist, they are not of an expulsive character. A Locis Roca, M.D.

Joly J. S.: The Etiology of Stones. J Urol 1934 32 54

Following a review of the history of stone formation and a consideration of the geographical distribution of the condition, the author discusses the rôle played by diet and disease in the causation of stones, the mechanism of stone formation, and the chemical character of the stones. With regard to the influence of diet he calls attention to the rôle of inadequate nutrition and especially vitamin deficiency. Among the pathological conditions favoring the formation of stones are fractures requiring prolonged immobilization, osteomyelitis, tuberculosis of bone, and diseases of the urinary organs such as hydronephrosis, vesical obstruction, congenital anomalies, and infection. Joly states that any factor impeding the viability of the primary colloid mechanism profoundly affects the solubility of stone-forming salts.

GILBERT J. THOMAS, M.D.

Frutkin G. C.: A Method of Hemostasis During Nephrotomy for Large Kidney Calculi. J Urol 1934 32 378

For the removal of large renal calculi, Frutkin applies pedicle clamp and on the posterior surface of the kidney makes a  $\frac{1}{2}$  inch incision with its apex at the renal pelvis. He uses a #11 Doyen curved intestinal clamp covered with soft rubber boots. After compression for from eight to ten minutes the clamp is released for from twenty to forty seconds. Several cases in which this procedure was used are reported.

GILBERT J. THOMAS, M.D.

Oppenheimer G. D.: Polycystic Disease of the Kidney. Ann Surg 1934 99 35.

Oppenheimer calls attention to the difficulty encountered at times in differentiating between congenital polycystic kidneys and the multiple cysts found in arteriosclerotic kidneys. This is of special importance in the diagnosis of unilateral polycystic disease.

Polycystic disease of the kidney is of two clinical types—that found in newborn infants and that found in adults. The former is often associated with other congenital anomalies. In most cases of the latter condition the symptoms develop between the ages of thirty five and fifty five years, and the average age of death is fifty years, indicating that life expectancy is decreased by from ten to twelve years.

The author states that there is a familial tendency toward the disease. While in most recent reports the bilaterality of the condition is emphasized, he presents two cases in which postmortem examination showed the involvement to be unilateral. One of the subjects was an infant and the other an adult.

On the basis of the symptoms the cases may be divided into eight clinical groups. The two chief groups are the cases with cardiorenal vascular disease and insufficiency and the cases with hæmaturia, infection, and large masses in the loin. In most cases there is either clinical or laboratory evidence of renal insufficiency. Of the cases reviewed, cysts of the liver were present in about 25 per cent, definite hypertension was found in the majority, and infection and stone formation were complications in 32 and 23.7 per cent respectively.

The author discusses the use of urography in the diagnosis and emphasizes the importance of the use of a non-irritating substance for retrograde pyelography.

In discussing the treatment he urges extreme conservatism. He believes that operation should be reserved for complications such as diffuse suppuration and stone formation. IRVING J. SHAPIRO, M.D.

Colston, J. A. C. Primary Tumor of the Ureter. A New Method for Complete Nephro-Ureterectomy. *Bull. Johns Hopkins Hosp.*, Balt., 1934, 55: 361.

Colston reports a case of primary papillary epithelioma of the ureter with the hitherto unreported complication of implantation in a probably pre-existing bladder diverticulum. The treatment consisted of nephrectomy followed, nine months later, when the correct diagnosis was made, by complete ureterectomy, and six months after the ureterectomy, by removal of the diverticulum containing the tumor implant. The correct diagnosis was not made until persistent bleeding from the ureter was discovered by cystoscopic examination and the ureterogram presented a typical picture.

Also reported are two cases of primary tumor of the ureter from the records of the Brady Urological Institute, both of which were fatal.

The difficulties in early diagnosis are discussed. The value of the diagnostic syndrome of Chevasu and Mock—obstruction to the passage of a ureteral catheter followed by a copious flow of blood from the ureteral orifice—and the great importance of the ureterogram are emphasized.

According to the literature, it is generally agreed that the treatment of choice for primary tumor of the ureter is complete nephro-ureterectomy.

Many methods of so-called complete nephro-ureterectomy are unsuccessful because they do not remove or destroy the mucous membrane of the distal stump. Complete eradication or destruction of the entire ureteral mucous membrane, especially the part in the intramural portion of the ureter where tumor implantation has been shown to occur, is of extreme importance.

The author describes a method of complete ureteronephrectomy in which the previously well-known steps are supplemented by a hitherto unreported technique by which the mucous membrane of the distal stump of the ureter throughout its whole course through the bladder wall is completely destroyed with the high-frequency current.

CLAUDE D. HOLMES, M.D.

## BLADDER, URETHRA, AND PENIS

Fresnals, J. Cutaneous Ureterostomy in the Treatment of Persistent Cystitis After Nephrectomy for Tuberculosis (*L'urétérostomie cutanée dans le traitement des cystites rebelles chez les néphrectomisés pour tuberculose*). *J. d'urolog. méd. et chir.*, 1934, 38: 315.

The development or persistence of irritability of the bladder following the removal of one kidney for tuberculosis may be due to the presence of tubercle bacilli in the urine or a vesico-ureteral reflux or both. When tubercle bacilli are found in the urine their source must be determined.

The indications for ureterostomy are (1) severe symptoms which cannot be otherwise relieved, and (2) a vesico-ureteral reflux, which may cause infection of the other kidney. Cutaneous ureterostomy is to be preferred to implantation of the ureter into the bowel (which is very dangerous when only one kidney remains), to cystostomy (which does not entirely relieve the symptoms and does not prevent reflux), and to nephrostomy (which causes destruction of the renal parenchyma). Its contra-indications are secondary infection of the remaining kidney with blockage of the ureter and a ureter too thick or infected to be brought to the skin. When ureterostomy is contra-indicated nephrostomy should be done.

In the technique of cutaneous ureterostomy used by the author the ureter is reached by an extraperitoneal approach through the lumbo-iliac region. It is divided with a cautery and the distal end tied off. The proximal end is then brought out through the incision and anchored to the muscles and skin, 2 cm. being left protruding above the level of the skin. A Nélaton sound is introduced through the ureter into the renal pelvis. The catheter is watched to prevent its becoming clogged. It is kept in place, and can be changed once a week by the patient.

After this operation the vesical pain ceases and there is little or no evidence of dilatation of the renal pelvis or ascending infection.

Of ten patients treated by the author, one could not be traced, three are well (one, seven years, and two, less than one year after the operation), and six are dead. Of the six who are dead, one died seven years after the operation of an intercurrent infection, four died six months, three years, one year, and eighteen months respectively after the operation of uræmia or generalized tuberculosis, and one died fifteen days after the operation with marked hæmoptysis. The ten cases are reported in detail.

MAX M. ZINZINGER, M.D.

## GENITAL ORGANS

Ross, E. R. The Surgery of Prostatic Obstruction. *Australia & New Zealand J Surg* 1954, 41: 30.

The author reviews the physiology and anatomy of the neck of the bladder discusses in considerable detail the types of disease of the neck of the bladder which cause obstruction, and describes his pre-operative and postoperative care of cases of prostatic obstruction.

He then reports the results in the first 100 cases in which he performed a perineal prostatic resection with the McCarthy instrument. His first 50 cases, which were selected, consisted chiefly of cases of large and small prostates. The next 77 cases were representative of all types of prostatic obstruction had been done. The best results were obtained in cases of slight hypertrophy and hypertrophy of the middle lobe. In 3 cases the first operation was not sufficient. In 1 case 3 operations were done. There were 4 deaths. The average length of time the patients remained in the hospital was twenty-three days whereas in a similar group of cases in which prostatectomy was performed it was forty-eight days.

In conclusion the author states that transurethral resection represents a marked advance in the treatment of prostatic obstruction. It is the operation of choice except for cases of very large hypertrophies. For the latter group, which he believes constitute about 3 per cent of all cases of prostatic obstruction, he prefers open operation.

THOMAS F. CHAFFIN, M.D.

Reggiani, M. M. The Behavior of the Testicle Following Partial or Total Removal of the Parietal Portion of the Tunica Vaginalis (Il comportamento del testicolo in seguito alla asportazione parziale totale del foghetto parietale dalla sguale preputa) *Arch Med di Clin* 1954, 37: 663.

The author states that his study was motivated by the disagreement in the results of removal of the tunica vaginalis which have been reported in the literature. While some investigators claim that removal of the tunica vaginalis has no effect on the testicle, others state that it may cause the testicle to undergo partial or complete atrophy.

Reggiani's study was made on dogs. In nine dogs the tunica vaginalis was removed partially and in ten dogs it was removed completely. At definite intervals thereafter the testicles were removed for microscopic study. In both groups of animals degenerative changes were found in the testicle soon after the operation. These affected all varieties of seminiferous epithelia. Their degree seemed to be directly proportional to the distribution of the cell. The interstitial cells of Leydig were markedly resistant to change. By special staining methods, glycolysis and lipolysis were demonstrated early. In a short period of time the degenerative cury disappeared and restitution occurred. The glycyne and fat returned to normal in about a month, and spermatogenesis and the appearance of the testicle returned to normal in about three months. The changes in the epididymis were practically negligible.

The author explains the changes observed as reaction to the trauma of the surgical procedure.

A. LOREN ROM, M.D.

# SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

## CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC

Lucchese, G. The Influence of the Suprarenals on the Formation of Bony Callus (L'influenza delle surrenali sulla formazione del callo osseo) *Polidin*, Rome, 1934, 41 579

The author reviews the history of our knowledge of the functions of the suprarenals. He calls attention to the importance of the suprarenal cortex as evidenced by the multiplicity of its functional activities. To determine the influence of the suprarenals on callus formation he performed experiments on three groups of guinea pigs each of which included four animals. In all three groups the radius was fractured and the ulna left intact. In Groups 1 and 2 a partial suprarenalectomy was done ten days later, and in Group 2 the operation was followed by the daily administration of cortical extract. In Group 3, which served as a control, only fracturing of the radius was done. One animal of each group was examined after ten, twenty, thirty-five, and fifty days. In Group 1, roentgen ray examination and biopsy showed delayed and deficient healing even after fifty days. In Group 2, they showed more than normal and more rapid callus production. In Group 3, they showed more marked healing than in Group 1 and less marked healing than in Group 2.

Lucchese concludes that deficiency of the suprarenals retards fracture healing, and that the injection of an extract of the suprarenal cortex advances fracture healing. BARBARA B. STIMSON, M.D.

Ellis, R. W. B. Osteopetrosis (Marble Bones, Albers-Schoenberg Disease, Osteosclerosis Fragilis Generalisata, Congenital Osteosclerosis) *Proc Roy Soc Med*, Lond, 1934, 27 1563

Osteopetrosis is known by several other names: "marble bones," "Albers-Schoenberg disease," "osteosclerosis fragilis generalisata," and "congenital osteosclerosis." It is characterized by areas of increased density symmetrically arranged. The compact bone encroaches on the medullary cavity, almost obliterating it. The most common sites of the lesions are the base of the skull, the vertebral bodies, and the long bones. Other bones usually show some degree of osteoporosis. Except for clubbing of the ends of the long bones and the posterior clinoid process, the general shape of the bones is unchanged. The name "marble bones" was not well chosen as the bones break more easily than normal bones. The term "chalky bones" has been suggested as the bones can be drilled and broken as readily as chalk. However, it is claimed by some that the sclerosed bone is abnormally hard and breaks in transverse areas of decreased density.

The disease is frequently familial. There are records of cases in which one of the patient's parents had the same affection. The condition may be present at birth. Delayed eruption of the teeth and dental caries are common. Encroachment of the cortex on the marrow cavity causes a disturbance of the blood-forming system resulting in certain forms of anemia and leukemia. The enlargements at the base of the skull sometimes cause neurological symptoms. Some of the cases of delayed growth may be due to pressure on the pituitary gland by the hypertrophied clinoid process.

The author reports two cases. The patients were brothers. One of them was two years and ten months of age and the other a year and a half. The parents were English and were second cousins. Neither the parents nor any of their relatives had a history of abnormal bone conditions. Both of the patients were delivered with instruments. The older boy was normal up to the age of six months. He then had a convulsion at the onset of pneumonia. Thereafter his eyesight was defective. His skull showed bulging of the frontal and parietal regions. Closure of the anterior fontanelle was delayed. The teeth were chalky and showed defective calcification. The fingernails showed platyonychia. There was bilateral primary optic atrophy. Roentgen examination revealed increased density at the base of the skull and of the cortices of the long bones, marked expansion of the ends of the diaphyses, and cortical encroachment on the medullary cavity. The Wassermann test was negative and the blood count normal. The serum calcium was 8.9 mgm per cent and the blood phosphatase 12.5 units.

The younger brother was breast fed for three months and then given cow's milk and a proprietary emulsion. His first teeth appeared at the age of five months, and he began standing when he was seventeen months old. He had a massive skull with a wide anterior fontanelle. A pigeon-breast deformity, beading of the ribs, and expansion at the ends of the long bones were found. Eye examination revealed dilatation of the pupils, bilateral internal strabismus, and bilateral primary optic atrophy. The calcification of the teeth was defective, and the nails showed platyonychia. The roentgen findings were practically the same as in the brother. The Wassermann test was negative. The serum calcium was 9.97 mgm per cent and the phosphatase 9.6 units. In neither case was there clinical evidence of thyroid or parathyroid enlargement.

These cases demonstrate the hereditary tendency of the disease and the disturbance of calcium metabolism. In some cases calcium deposits have been found in the tendons, myocardium, skin,



vertebrae, and renal pelvis, showing that the disease is more than a bone affection.

On the basis of the theory that the increased calcium deposits were due to parathyroid deficiency, the author's patients were given daily injections of parathyroid hormone. In both cases there was an immediate rise in the serum calcium during the injections, but after about two weeks this was followed by a rapid fall. The fall was attributed to an immunity to the injections. The blood phosphorus varied inversely with the calcium.

The results of the treatment were in accord with the findings of studies on rats. The evidence appears to indicate that the disease is of parathyroid origin.

WILLIAM ARTHUR CLARK, M.D.

Richard, A., Dupuis, V. P., Roderer, C., and  
Fryer, R. I. The Dychondroplasia of Ollier  
(La dychondroplasia d'Ollier). *French and Par*  
934. N. 91 815

The authors report in detail two cases of multiple skeletal anomalies in girls seven and eleven years of age. The anomalies consisted chiefly of shortening and deformities of the long bones of the extremities and of the small bones of the hands and feet with secondary dislocations. The condition was discovered during earliest infancy but hereditary factors could not be demonstrated.

Clinically the lesions appeared to be exclusively unilateral in one case and predominantly unilateral in the other. The right lower limb showed shortening of 9 cm. in the first case and shortening of 1 cm. in the second case. The right upper limb showed shortening of 4 cm. in the first case and shortening of 7 cm. in the second. The lesions in the hands consisted of shortening and deviation of the digits cases, but were more pronounced in the second case than in the first. In the first case biopsy showed that the lesion was not cartilaginous tumor but a cartilaginous dysplasia with islands of ossification. Osteotomy performed when the patient was two and a half years old showed the lesions to be evolutionary. Osteotomy which was performed when the patient was seven years old and was followed by the ossification. This three months demonstrated that the dysplasia was capable of ossification. These findings justified the diagnosis of Ollier's dychondroplasia.

While the term Ollier's disease is usually employed to designate any cartilaginous dysplasia the authors define Ollier's disease as definite, well-differentiated clinical entity characterized by shortening and deformity of the diaphyses of the larger long bones. Osteochondromatosis involves primarily the extremities, especially the fingers. In the cases reported in the literature the condition was predominantly unilateral, the lesion on the other side having been discovered only on roentgen examination. In sixteen cases the involvement was strictly unilateral. Ollier reported two cases in which the lesions were bilateral.

The dychondroplasia begins during the first years of life. In some cases it has been discovered in males. It occurs more frequently in females than in males. Except when associated with exostoses it is not hereditary.

Particularly the long bones of the extremities and the small bones of the digits are involved. Flat ribs may also be affected, but never the bones of the face, skull, spine, wrist, or ankle (except perhaps the calcaneus). The deformities increase up to the age of calcification, and if operated upon too early will recur. There are four stages: cartilaginous stage, a stage of calcification, a stage of beginning ossification, and a stage of consolidation.

In discussing the differential diagnosis of the condition from multiple exostoses and chondromatosis, the authors state that the formation of multiple exostoses begins during the second period of childhood, occurs more frequently in males than in females, frequently presents hereditary aspects, and causes only roentgenologically demonstrable lesions of the hands, the bones being formed, body of chondromatosis. The lesions are bilateral, and the appearance of chondromatosis in adults is quite rare. In chondromatosis the lesions appear in early infancy are more common in males than in females, frequently show bony features, the lesions of the hands are of prime importance, the epiphyses are formed of enchondromas, the lesions are bilateral, and chondromatosis is fairly common in adults.

From his experiments Bentzen concluded that Ollier's disease is not growth dysplasia but metaphyseal metaplasia of synchondrotic origin. The authors believe, however, that the lesions produced experimentally by Bentzen were those of Ollier's disease.

From the autopsy specimen described by Spenser in 1905, the authors conclude that the diaphyseal lesions in dychondroplasia are either enchondromas of pericardial origin or metaphyseal lesions developing in the diaphyses. The fact that the condition has been discovered at birth indicates there is congenital bony dysplasia. The authors are of the opinion that whereas Ollier's disease constitutes a distinct disease entity it belongs to a group of diseases for which they propose the name "enchondrodysplasia" to signify changes in normal changes consisting of the presence, at the level of the regions involved, of an abnormal amount of cartilage capable of ossification.

ELMER SCHLAEGER MOORE

Masquet, J., Janbert De Benjume, A., and Hoch.  
R. Progressive Myelitis Ossificans (Myeloma  
ossificante progressive). *French and Par* 934. 41  
8. 3

Progressive myelitis ossificans has been known in England since 1744 and in France since 1840, but was first recognized as a clinical entity by Miesch-

meyer in 1869. Although a rare condition, nearly 300 cases have been reported.

The authors report the case of a boy two and a half years of age which they consider very typical. The child was the fifth in a family in which the other children were entirely normal. The family history was negative. The patient was normal until one year of age, when he had an attack of dysentery. Three months later, a fall was followed by the formation of a hæmatoma in the left parietal region. The hæmatoma later disappeared but was followed by a series of nodular swellings in the cervical and occipital region, some of which disappeared and others of which showed ossification. When the child was seen by the authors, ossification in the cervical region had caused a slight antelexion resembling that of cervical Pott's disease, and there were osseous swellings in the left retromastoid region and the subclavicular region. Both pectoral muscles showed marked but asymmetrical ossification. Asymmetric osseous infiltration was found also in the muscles of the scapula and sacrolumbar region. There were several congenital deformities—microdactylia, a deformity of the thumbs, bilateral hallux valgus, and cryptorchidism. Roentgenograms disclosed thickening of the clavicles, deformities of the bones of the hands, and bilateral coxa valga. They also showed that the bony swellings and infiltrations in the muscles were entirely independent of the bony skeleton, thus proving that they were not exostoses. On the medial border of each tibia there was a small exostosis originating near the point of insertion of the popliteus muscle. There was no definite increase of blood calcium and no evidence of endocrine dysfunction. The child was active and, although there was some retardation of speech, was normal mentally. Attention is called to the fact that while, as in other cases reported, the congenital bony deformities were symmetrical, the development of the osteomata was asymmetrical. The co-existence of such bony deformities with progressive myositis ossificans supports the theory that the disease is due essentially to a congenital "perversion" of ossification or, more exactly, an anomalous development of the mesenchyme from which bone, cartilage, and connective tissue are formed.

Various methods of treatment proposed for progressive myositis ossificans have not proved effective. Numerous drugs, including acids, iodides, fibrolysin, and mesothorium, have been tried without definite results. Radiotherapy, which has given encouraging results in the circumscribed form of myositis ossificans, has been advocated by Novak-Josserand, but is considered dangerous by Rosenstien and others. The authors have not tried any form of physical therapy in their case, and do not think that surgery is indicated. They state that any operation would be only palliative and of value only to relieve a joint deformity or perhaps some other deformity definitely dangerous to life.

Alice M. Meyers.

Bristow, W. R. *Acute and Chronic Sprains*. *Brit. M. J.*, 1934, 2, 669.

The muscles may be considered the first line of defense of a joint. If a spraining force is too great or of too long duration, the muscles give way and the ligaments furnish the resistance. When the ligaments yield, a sprain results. Under extreme force, the bone takes the stress and a fracture results as the soft tissues are unable to protect it.

In the diagnosis of sprain it is important to exclude fracture. If the tenderness is localized over a ligament attachment, the conclusion may be drawn that a simple sprain has occurred. If the bone is tender, a fracture should be suspected and a roentgenogram made.

The principles of treatment of a sprained ankle include (1) pressure to limit the swelling, (2) protection to prevent further damage, and (3) encouragement of function to promote recovery. A pressure bandage should be applied over cotton wool. The heel should not be left out as it is one of the parts most needing support. After about thirty-six hours the pressure bandage should usually be replaced by a protective strapping. In slight sprains, however, this protection may not be necessary. Early use of the ankle should be advised. The patient should be encouraged to walk at once within reasonable limits. Stimulation with a faradic current helps the muscles to regain tone. Gentle massage should be given to get rid of the swelling and improve the circulation.

Although simple sprains heal quickly, more severe sprains may be followed by persistent symptoms and recurrence. Chronic sprains are characterized by pain, muscle atrophy, limitation of movement, and synovitis. The patient with a chronic sprain may get into the hands of a bone setter or other irregular practitioner who tells him that a bone is "out" and proceeds to "put it back." What such a practitioner really accomplishes is the breaking up of adhesions which renders the patient more comfortable. This can and should be done more often by the legitimate surgeon.

For the treatment of the chronic sprain the author advises putting the joint through its full range of motion either under anesthesia or by repeated manipulations to the extent of the patient's tolerance without anesthesia. The building up of muscle strength by active exercise and faradic stimulation is also of importance. The so-called "tennis elbow" may be classed as a chronic sprain. Other examples of such sprain are the tearing of muscle fibers from the pubic ramus (rider's strain) and tearing of the soleus group.

WILLIAM ARTHUR CLARK, M.D.

Smart, Sir M. *The Pathology and Treatment of Sprains*. *Brit. M. J.*, 1934, 2, 673.

The author makes a distinction between the words "strain" and "sprain." He defines "strain" as a rupture or injury of muscle fibers, and "sprain" as an injury to the joint ligaments and capsule. He states that the latter is the more serious lesion.

An acute sprain may be so slight that it is neglected by the patient. However there is danger that the joint may subsequently be much less efficient because of the wasting and loss of tone in the muscles. The delicate areolar connective tissue which fills in the space between the more firm joint structures and carries blood vessels and nerves is damaged in even the slightest injury and the damage to this tissue may be responsible for continued disability especially when the treatment has been prolonged rest. The soft areolar tissue becomes swollen in stagnant lymph, and unless the lymph is removed it undergoes hardening changes leading to or comfort and disability. Too much rest in treatment is responsible for this condition. Rest is only palliative treatment. It relieves pain, but may lead to the rate of absorption of the effusion, and this is best increased by active use. A recently injured muscle can be made to contract and relax without appreciable motion of the joint across which it passes. Such activity causes no pain, yet produces the desired effect.

WILLIAM ARTHUR CLARK, M.D.

**Bosch, V.** *Researches on the Method of Healing of Experimental Lesions of Tendons (Rupture of tendo di guingone della mano spuntatale do tendini).* Arch sci di chir 934: 35 433

The author presents some of his observations with regard to the structure of tendons and reports the results of his studies of the healing of wounds made by tenotomy in dogs, horses, and asses. In some of his experiments he left the tendon ends widely separated in order to study the influence of function on regeneration. In all of them the tendon sheaths and the external peritendineum were preserved.

From his studies of tendons at periods ranging from forty-eight hours to two years after tenotomy especially in the horse and the ass Bosch concludes that all parts of tendons and their sheaths have regenerative powers. In young animals he found that the ends of the tendons of the flexors of the phalanges, even when separated from 3 to 5 cm united between them which in time became tendinous.

Under these conditions the process of regeneration of the tendon bundles and the internal and external peritendineum is similar to the process of normal development and growth of tendons. There is, in tendons and parallel formation and above newly formed tenoblasts and elements which provide the internal peritendineum and the secondary tendons. Between these formations of the collagen fibers are histological elements from which the peritendineum separating the tertiary tendon bundles is derived.

The external peritendineum is reformed by proliferation of the tenoblasts of its deep layer some of which participate also in the formation of the new tendon fibers.

The new formation of tendons observed in the peripheral divided tendon in the horse from twelve to eighteen days after tenotomy with considerable separation of the cut ends indicates that in the equine species functional stimulation is not essential for the regeneration of tendons.

Researches on the process of healing of tendons with large synovial sheaths indicate that the synovial cells or other histological regeneration of the tendons of the tendon.

The importance of the age, species, and general condition of the animal in tendon repair is discussed. The reactivity and proliferating characteristics of the tendon sheath and the external and internal peritendineum are important for the healing of a divided tendon in an aseptic field. Observations indicate that the early development of these parts is an important prerequisite for the success of operations on tendons. The hyperplasia in the sheaths often far surpasses the hyperplasia in the tendons.

A LOUIS ROSE, M.D.

**Kacht, B.** *Subacute Suppurative Osteomyelitis of the Atlas (Zur Kenntnis der subakuten eitrigen Osteomyelitis des Atlas).* Wien klin Wochenschr 934: 53

Non-specific suppurative disease of the vertebral column is relatively rare. T. cases, only about 300 cases have been reported. Among these are only 3 cases of osteomyelitis of the atlas.

The danger from osteomyelitis of the atlas is very great since, in addition to sepsis, meningitis threatens the region of the spine of the neck which very early leads to limitation of the movement of the neck. After an interval, a high fever and chills develop. Soon, there is rigidity of the neck which frequently leads to diagnosis of meningitis. The high fever, the often quite marked leucocytosis, and the mild character of the pain after jolting of the vertebral column speak against tuberculous spondylitis. There may be history of furuncles, abscesses, and tonsillitis. The roentgenogram is either of no aid in the diagnosis or yields positive findings only relatively late. Eventually an abscess may explain the picture.

The author reports 3 cases, in one of which the diagnosis was confirmed by autopsy and in the other two by roentgen findings. In the first case the abscess was found behind the sternocleidomastoid muscle. In the second case it was retropharyngeal. In the first case the cause was hemolytic streptococcus, and in the second case the staphylococcus pyogenes (St. Hauser). LOUIS ROSE, M.D.

**Bellinckx, L. G.** *A Contribution to the Study of Radio-Ulnar Synostosis (Contribucion al estudio de la sinostosis radio-ulnar congenita).* Rev med de Barcelona 934: 193

Radio-ulnar synostosis is usually congenital malformation and often hereditary. It is more frequent

in females than in males. It is characterized by osseous union of the two bones of the forearm at their proximal extremities. In many cases it is accompanied by other malformations such as hypertrophy and incurvation of the radial diaphysis, atrophy and incurvation of the ulnar diaphysis, and dislocation of the head of the radius.

The chief clinical sign is fixation of the forearm in pronation. Functional disturbances may remain masked by exaggerated movement in neighboring joints. The condition is disclosed by roentgen examination.

The treatment is surgical. The two operations possible are:

1. Section of the synostosis, resection of the head of the radius, and the introduction of a tag of muscle and fascia between the sectioned ends of bone.

2. The formation of a pseudarthrosis in the radius by resecting a portion of its diaphysis below the synostosis. This procedure combined with physical therapy gives good results.

WILLIAM R. MEEKER, M.D.

Schaer, H. *Patella Partita* (*Die Patella partita*). *Ergebn. d. Chir.*, 1934, 27, 1.

Partite patella is characterized by separation of the knee cap into two or more fragments. The anomaly was first described by Gruber, of St. Petersburg, in 1883.

The condition is of five types. The author describes the individual types and the roentgen findings in each, citing illustrative cases from the literature. The first and second types are quite rare. The third type is by far the most common. To this type belong also the so-called emarginations (marginal defects) in the upper outer quadrant of the patella. The roentgenogram in this type usually discloses a bilateral half-moon-shaped osseous defect similar to that in the third type but without a demonstrable bone shadow in the defect. Another anomaly of the knee cap which shows a close relationship to the third type of fissured patella is incomplete fusion with the main mass of the patella of an accessory nucleus on the upper, outer border of the knee cap. In the fourth type of patella partita the fissure is at the medial border of the knee cap. These types are rare. In the fifth type of partite patella, which was first described by Harnisch, the patella is divided by a frontal cleft and made up of two apposed concave disks separated from each other by a uniform fissure plane several millimeters wide which is concave toward the knee joint. This condition causes no functional disturbances. It is believed to be a congenital anomaly.

As a rule partite patella is first discovered by chance during roentgen examination of the knee joint for some other condition. Only occasionally is its presence determined by clinical examination alone. In many cases of the second and third types there is a considerable increase in the transverse diameter of the knee cap. As a rule partite

patella is described as a harmless anomaly as it usually causes no symptoms.

In the interpretation of the roentgenogram in a case in which the presence of fissured patella is doubtful it must be determined whether the condition is an anomaly or a traumatic lesion such as a patellar fracture. In recent years this problem, which is so important in insurance cases, has given rise to lengthy discussions. As a rule the differentiation is relatively easy, but in some cases the diagnosis requires careful consideration of the history and clinical course and repeated examinations.

In exceptional cases of partite patella surgical intervention is indicated, as when trauma has loosened and dislocated the isolated bony nucleus. The author cites a case.

Knowledge of patellar variations in the animal kingdom is insufficient for a phylogenetic explanation of patella partita. However, from the findings of the investigations carried out to date it appears that in some cases ossification of the knee cap may be multicentric. This fact is the chief basis of the theory ascribing the origin of the fissured knee cap to the imperfect ossification of several nuclei. The conditions under which the abnormal ossification occurs are still unknown. On the basis of his own pathologico-anatomical studies the author ascribes patella partita to the persistence of epiphyseal lines which vary from case to case and show various degrees of cartilaginous degeneration. The problem of the nature of patella partita has given rise to long discussions and various theories. Gruber believed that the condition is the result of imperfect fusion of two osseous centers. This is the theory most generally accepted today as it is known that the knee cap may ossify from several ossification centers. However, it is still unknown why, in certain cases, the bony patella arises from several nuclei, whether this multiplicity is based on a multinuclear anlage of the cartilage, or to what such an abnormal anlage is to be ascribed.

Siemens was the first to report the familial occurrence of split patella. He observed the condition in the father and a brother of one of his patients and in two brothers of another.

From numerous cases, some of which he observed clinically himself, the author has gained the impression that knee joints in which the knee cap is fissured react considerably more intensely as regards the duration of symptoms as well as objective changes. (B. VALENTIN.) JOHN W. BRENNAN, M.D.

Wiles, P. *Flat-Feet*. *Lancet*, 1934, 227, 1089.

The author describes the deformity of pes valgus and discusses the mechanism of its production and the methods of treatment.

The normal longitudinal arch depends upon three factors: (1) a relation of the involved joints which permits transmission of the body weight from bone to bone, (2) maintenance of the position by active muscular contraction, and (3) tying together of the piers of the arch by the intrinsic muscles.

*Pes valgus* is an eversion and abduction of the foot made plantigrade by elevation of its medial border with involvement of the subtarsaloid joints. It originates congenitally in the asthenic type of infant. It may become corrected when the child begins to walk or between the ages of four and six years. In other cases, frequently those of persons with poor muscular tone, the valgus posture persists into adult life. Adults who have had good foot posture previously may acquire valgus feet as the result of muscular failure and postural imbalance brought about by illness, standing, prolonged fatigue or increase in body weight, or shortening of the tendons of Achilles.

As *pes valgus* is produced by eversion and abduction, adduction and inversion with lowering of the head of the first metatarsal will produce a normal arch. This change is accomplished by a rotatory movement produced at the subtarsaloid joint by one of the two following mechanisms:

1. The forefoot and on calcus are moved inward while the leg is kept still, and the inflexion is corrected by external rotation of the whole leg and foot.

2. The forefoot and on calcus are kept still while the leg is rotated externally.

Especially the types due to muscular failure require this treatment which in reality consists of re-education of the muscles so that the patient consciously inverts and adducts the foot and depresses the first metatarsal head. The ordinary mechanical arch support tilting up the inner border of the foot does not appreciably alter the position of the subtarsaloid joint and is therefore of little value. As rule defects of bodily posture, such as tilting of the pelvis, and diseases of the nervous system must be considered and treated before the valgus is corrected. Shortening of the tendons of Achilles is corrected by exercise or operation.

Patience and cooperation are necessary and over correction must be avoided.

In painful flat foot there may be scarified or contracted interosseous ligaments which require the breaking up of adhesions by manipulation and continued motion to prevent recurrence.

R. BOLAND & REED, M.D.

Bonghiatti, O. A Clinicostatistical Study of the Cases of Congenital Club-Foot Observed at the Rizzoli Orthopedic Institute in the Period from 1899 to 1933. *Tracce clinico-statistiche sui casi di piede torto congenito osservati all'Istituto Rizzoli dal 1899 al 1933* (Ann. d'Ortop. e ortoped. 1934, 9, 33).

The report is based on 135 cases of club-foot representing 1,487 club-feet. The statistics are worked out in detail, shown by tables, graphs, and maps and compared with those of other investigators. The findings are summarized as follows:

Congenital club-foot is twice as frequent in males as in females and more frequently bilateral than unilateral. When it was unilateral it occurred more often on the right side than the left. It

bilateral more frequently in males than in females. It occurred on the right side more often in females than in males, but on the left side with equal frequency in males and females.

*Pes equinus varus supinatus* was present in 50 per cent of the cases. It was more frequently bilateral than unilateral. When unilateral, it occurred more often on the right side than on the left.

*Pes talus valgus* occurred in 9.23 per cent of the cases. It was more frequently bilateral than unilateral. When unilateral, it occurred with equal frequency on both sides.

Metatarsus varus was present in 3.93 per cent of the cases. It was more often unilateral than bilateral and occurred more frequently on the left side than on the right.

Mixed forms were present in 5.2 per cent of the cases. The most common was equinus varus supinatus of one foot with talus valgus of the other.

The data are insufficient to permit conclusions as to heredity and familial occurrence.

Dystocia was reported with about the same frequency as in the cases of individuals without such deformities. The amniotic fluid, as said to have been normal in quantity in 31.66 per cent of the cases, increased in 18.18 per cent, decreased in 40.53 per cent, and absent in 9.61 per cent. These percentages seem high, especially as oligohydramnios is rather rare. The frequency of such records in cases of congenital club-foot indicates that such variations are of importance in the genesis of the deformities. A noteworthy also is the frequency of history of podalic presentation (1.50 per cent of the cases). Undoubtedly the position of the fetus in the uterus and the consequent presentation are of etiological importance.

Associated deformities are present in 7.69 per cent of the cases. The most common is congenital dislocation of the hip, which occurred in 3.55 per cent, and the next most common, multiple deformities, which occurred in 2.90 per cent.

The geographical relationships are interesting. In the Province of Bologna congenital club-foot is more common in the flat regions than in the mountainous regions. In the province as a whole the condition occurs in about one of every 1,000 inhabitants, but in number of communes the corresponding figure is 50 and in one commune it is 5. Cases occur in isolated regions. In some regions no cases have been observed for as long as thirty-four years.

Among congenital deformities, club-foot ranks second to dislocation of the hip and is followed by torticollis, the incidence of these 3 conditions being respectively: 73.70, 18.61, and 2.7 per cent.

The article is followed by bibliography.

M. F. STRECH M.D.

Lamy, L. The Congenital Contracted Valgus Foot (Pied tortu valgus congénital contracté). *Bull. et Mém. Soc. d'orthopédie de Paris* 1934, 24, 24.

In 1914 Nord-Jensen called attention to special anatomical lesion of the congenital club-foot.

which is different from that of the acquired flat-foot. When a lateral roentgenogram of a flat-foot of a child about fourteen years of age is examined, it will be noticed that the long axis of the calcaneum makes an angle of only 5 or 6 degrees with the sole of the foot, while in a normal foot this angle is 14 degrees. The astragalus is depressed and inclined forward, and the cuboid is low at its anterior end. In the congenital flat-foot the angle between the calcaneum and the sole is reversed, this bone being rotated so that its posterior end is higher than its anterior end, and the angle with the plane of the sole opens posteriorly. The astragalus is also rotated or is tilted forward so that its long axis is almost perpendicular. The scaphoid is in contact with the superior surface of the neck instead of the head of the astragalus. The lower border of the skeletal structure forms a curve downward, the apex of the curve being at the calcaneocuboid joint. The foot itself shows a large convex valgus bulge. When seen from behind, the outer margin is higher than the inner and the tendon of Achilles makes a sharp curve inward. The anterior part of the foot is abducted and the toes are contracted in hyperextension. The fixed, irreducible character of the deformity is striking. The patient walks with difficulty and is easily fatigued.

The author has operated upon six children for the correction of this deformity. In the cases of five of them the operation was done on both feet. The first patient was nine years old and had been under observation since birth. At operation on the left foot the vertical astragalus was exposed through an external incision and its inferior half removed, together with neighboring parts of the calcaneum, cuboid, and scaphoid. To obtain correction of the extreme valgus deformity it was necessary to cut the peroneal tendons and lengthen the extensors. Bone chips were placed in an open space in front of the external malleolus. A plaster cast was then applied with the position of the foot corrected as much as possible. In the right foot the astragalus was removed completely with the exception of the superior cartilaginous part, but neither the peroneals nor the extensors were cut. The leg was advanced over the foot, and a somewhat better arch obtained than in the left foot. The result was very gratifying. The child was able to maintain a normal equilibrium, walk, run, and wear shoes of normal shape.

In the case of the second patient, who was five years old, astragalectomy was done on both feet with a good result. To reduce the deformity it was necessary to cut the external lateral ligament. A similar procedure was carried out in the four other cases with good results.

The foot is placed in moderate varus for one month, and at the end of that time a light brace is made over a model of the foot. Walking is begun at the end of two months. Reports in the literature show that other surgeons are in accord with the author regarding the operative procedures. The necessity for removing the astragalus, sectioning

the external lateral ligament, and filling up the space in front of the external malleolus is emphasized.

WILLIAM ARTHUR CLARK, M D

Browne, D Talipes Equinovarus *Lancet*, 1934, 227 969

Abnormal dimples are produced by the contact of bony points with the uterine wall and increased intra-uterine pressure. Talipes equinovarus is a bending deformity with pressure on the outer border of the foot caught in an unyielding position, with "metatarsal" and "extreme" varus of varying degree. Muscle atrophy results from immobilization, and the peronei and extensors are stretched while the stronger opposing muscles remain contracted.

Single deformities are never severe. Bilateral deformities are always nearly equal.

The equinovarus deformity favors the stronger calf muscles and, if untreated, becomes progressively worse, whereas the common calcaneus is self-correcting because of the excess of power of the calf muscles over their opponents.

The author rejects the theories which attribute club-foot to nervous factors, arrest of development, hydraulic pressure, defective germ plasm, and congenital dislocation of the astragaloscaphoid joint. However, he admits that the hypothesis of a mechanical origin of the condition has not been proved.

The aims of treatment are natural use of the forefoot held at the correct angle of 20 degrees outward from the sagittal plane of the body and full range of motion in the joints. Correction of the deformity of the heel follows naturally. The device used should not only correct the position of the forefoot but allow its use so that unbalanced and atrophied muscles will be aided.

In the author's method of treatment the deformity is corrected by forcible manipulation into the opposite deformity of calcaneovalgus. In the cases of infants under two years of age this is done with the hand, and in the cases of older individuals with a simple "nutcracker" vice which the author describes. The procedure causes very little soreness. After the correction, the feet are placed in aluminum splints or club-foot boots. The normal foot is kept at 20 degrees with the sagittal plane and the deformed foot in calcaneovalgus. This position is maintained by a horizontal crossbar between the legs. The manipulation is repeated every two weeks. Use of the feet is encouraged. Older patients are taught to walk with the apparatus.

The author discusses the use of the Thomas wrench, tenotomy, open operation, plaster-of-Paris immobilization, adhesive plaster fixation, club-foot shoes, and fixation on the bent knee. He maintains that tenotomy and open operation are definitely contra-indicated. He believes that the results of his method in previously untreated cases are better than those obtained by other procedures.

RUDOLPH S REICH, M D

# INTERNATIONAL ABSTRACT OF SURGERY

## SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Bouquet and Du Bourgnet: Indications for Rachi  
synthesis (Indications de la rachysynthese) *Rev*  
*de chir. Par* 934, 31 654.

Rachysynthesis, or arthrodesis of the spinal column, is a method of surgically immobilizing a section of the spinal column. It may be arthritic or the spinal column employed heretofore—the use of the plaster bed, continuous extension, and the plaster cast—are all more or less imperfect, time-consuming, and expensive. Absolute fixation, thus brought about by operation in a much shorter time.

The operation most frequently performed is Albee's rigid grafting. In this procedure the spinous processes are exposed and the processes of the distally vertebra or vertebrae and the vertebrae immediately above and below the latter are split. A graft of the desired length taken from the patient's tibia is then placed in the clefts in the spinous processes and fastened by firing a layer of muscle and sponges over it. Variations of this procedure are used to adapt the operation to special conditions.

The operation is indicated in severe scoliosis following infantile paralysis in which the prognosis under ordinary orthopedic treatment is poor. As a rule it should be performed about two years after the attack of infantile paralysis. It is indicated in all forms of scoliosis which cannot be corrected by ordinary orthopedic treatment, including progressive congenital scoliosis with a tendency toward aggravation, old rachitic scoliosis with a tendency to progress, and essential scoliosis which becomes worse in spite of treatment. In the presence of active pulmonary tuberculosis scoliosis should not be operated upon, but after the tuberculous lesions have become stationary ankylosis of the spinal column in good position may be done and will improve the long capacity. The cases must be carefully selected and the operation performed at just the right time. In cases of scoliosis following thoracoplasty pleurisy, chorea, or tetanus, a cure can be obtained by orthopedic treatment and operation is not indicated. Operation, when necessary should be performed before various attitudes have become irreducible.

As a general rule the spinal graft should not be applied until between the tenth and twelfth years of age. The operation should be preceded by orthopedic treatment to bring about a good position. The osteosynthesis will maintain the correction brought about by the orthopedic treatment, fix the scoliosis, prevent recurrence in 90 per cent of cases, improve the general condition and the circulation, increase the capacity of the lungs, and decrease tachycardia and polyphoria.

The operation is indicated in spondylolisthesis and in closed traumata of the spinal column. In tuberculous of the spinal column in young children it is indicated only exceptionally as it may interfere with growth. However in high cervical and sub-

occipital lesions it may be necessary as a life saving measure. It is indicated absolutely in the cases of patients between fifteen and thirty-five years of age, relatively in the cases of patients between thirty-five and fifty years of age, and only exceptionally in the cases of patients more than fifty years old.

AUSTIN GOSWAMY, M.D.  
sacro-iliac

Messert, M. R. *Sacro-iliac Surgery* (Chirurgie  
sacro-iliac) *Bull. et méém. Soc. d'orthopédie et*  
*Par* 934, 26 497

Unlike most joints, the sacro-iliac joint is formed embryologically by the juxtaposition of two bony systems rather than by vacuumation in the bone. The thin bend of tissue separating the bones forms the articular cavity. The physiological adaptation of this joint to the upright position is not complete. The poor fixation of the sacrum to the pelvis gives rise to numerous anatomical anomalies and functional disturbances. When the cause of certain forms of scoliosis is sought, the sacro-iliac region should not be ignored. The line of the articulation may be so oblique that the sacral spine lies at an angle with the perpendicular axis of the pelvis. This results in a low lumbar scoliosis such as was found by the author in a child ten years of age. In this case the pelvic ring was not completely closed in the back and surgical fixation of the sacrum on the pelvis was proposed.

Sacrofixation is observed rather frequently. If it is unilateral it may become a veritable infirmity. Fixation of the sacrum on the pelvis by bilateral arthrodesis or bone grafting will correct the poor attitude and relieve the symptoms.

A hypermobile sacrum will cause symptoms and a disturbance of symmetry in the lumbar spine. In the case of a girl of fourteen years this condition was cured and a lumbar scoliosis was straightened not by surgical fixation of the sacrum. Hypermobility due to trauma III usually correct itself in time without surgical intervention.

Tuberculous of the sacro-iliac joint is a positive indication for surgical arthrodesis. The introduction of a transverse graft from one ilium through the sacrum to the other ilium was first reported by the author in 1913 and since then has been done with success by others. The author has performed this operation on more than twenty patients. Walking is allowed after about three months. All of the results indicate that this extra-articular tibial grafting is an excellent procedure.

WILLIAM ALBERT CLARK, M.D.

Bristow W. R. *Results of Operations on Painless Hip*. *Ann Surg* 934, 60 913

In cases of painful hip persistence of the pain and progressive disabling deformity are the two indications for operative treatment after conservative measures have failed. The two operations to be considered are arthrodesis and arthroplasty. In thirty-five of forty-two cases in which arthroplasty as done the pain was relieved, but the range

of movement remained small and the patients had a decided limp. Of fifty-six cases of non-tuberculous arthritis, arthrodesis resulted in a stable hip in thirty seven, and of forty-five cases of tuberculous hip, it resulted in bone fusion in eighteen. Arthroplasty fails if an active infectious process is present, and the presence of such a process is often difficult to determine. The results of arthroplasty cannot be predicted. This operation should be done only when there is a definite indication for mobilization of the hip joint. The results of arthrodesis are predictable, this operation therefore being generally the preferable intervention.

CHESTER C. GUY, M.D.

**Huet and De Fourmestraux** The Treatment of Suppurative Arthritis of the Knee Exclusive of War Injuries (Traitement des arthrites suppurées de genou en dehors des traumatismes de guerre) *J de chir*, 1934, 44 537

The authors omit post-war injuries from their discussion as these represent the most virulent type of suppurative arthritis. They state that suppurative arthritis of the knee is rarely a metastatic arthritis of hæmatogenous origin. In almost all cases it may be traced to a surgical cause. The most common causes are puncture wounds, surgical intervention on the knee joint for meniscus removal or the introduction of a Kirschner wire, osteomyelitis with erosion of the articular cartilage, and periarthritic suppuration such as occurs in prepatellar bursitis. Two types are to be distinguished—an articular empyema (Volkman's purulent synovitis) and a capsular phlegmon. In the former spontaneous healing may occur, but in the latter the prognosis is unfavorable as almost always there is complete loss of function. In the empyema the physical signs are almost all localized and motion in the joint is impossible because of the muscle spasm. In cases of capsular phlegmon the muscles lose their power of splinting and there are marked constitutional symptoms.

The operative procedures include puncture with a needle or trocar, with or without lavage, enlarged punctures, arthrotomy with or without drainage, synovectomy, the Laeven operation, resection, and amputation. Treatment with vaccines, bacteriophages, and specific sera has also been recommended. The authors believe that in the cases of adults puncture should be done immediately and if the temperature does not fall arthrotomy should be performed. The arthrotomy should be sufficient to permit adequate drainage. In cases of empyema, active motion should be instituted immediately and if it is too painful should be facilitated by the use of novocain. In cases of the phlegmonous type immobilization is indicated. In the very severe cases in which immobilization does not result in restoration to normal or at least a reduction of the fever, joint resection should be considered. In the cases of infants, in which resection is impossible, synovectomy or temporary disarticulation should be done.

WILLIAM C. BECK, M.D.

## FRACTURES AND DISLOCATIONS

**Houdard, L., and Judet, J.** The Value of Modern Methods of Osteosynthesis by External Fixation in the Cases of Adults (Valeur des méthodes actuelles d'ostéosynthèse par fixateur externe chez l'adulte) *J de chir*, 1934, 44 673

The authors state that the method of holding bone fragments in place by nails projecting through the skin fell into disrepute because of various difficulties. They believe, however, that the difficulties can be overcome and that this method is of great value as it provides rigid fixation without the presence of metallic substances in the immediate region of the fracture. They do not believe that the nails favor the spread of infection from the skin surface to the bone.

They describe briefly the techniques previously used, especially the method of Boehler. Boehler places a metal guide on the reduced fracture for the introduction of the screws and uses a special clamp to hold the bone fragments and guide together. After the screws have been inserted and bolted to the external plate, the guide is removed. The difficulty encountered in this method is the application of the guide to areas where the bone is flattened out or curved or the maintenance of reduction is difficult. Therefore the authors now employ the method devised by Judet. In this procedure, which is based on the same principles as that of Boehler, the external plate is used as a guide for the screws. The clamp holding the fragments reduced is therefore undisturbed during the application of the screws and the incision need not be so large. The authors do not describe their technique in detail, but state that the screws must be placed as far as possible from the site of the fracture except where a loose fragment necessitates direct fixation. The screws must go into the opposite cortex, but should not project. The apparatus must be so placed as to avoid the neighborhood of important nerves and blood vessels. No plaster should be used. The patient should be encouraged to move the adjacent joints. The screws are easily removed after the fracture has healed. The authors believe that this method may be employed for cases of pseudarthrosis and compound fractures.

They report twenty-seven cases and include in their article a number of roentgenograms showing the apparatus.

BARBARA B. STIMSON, M.D.

**Fèvre, M., and Dupuis, P.** The Treatment of Irreducible Congenital Dislocation of the Patella (Traitement de la luxation congénitale irréductible de la rotule) *J de chir*, 1934, 44 833

The authors state that an extensive joint operation is necessary for the correction of irreducible dislocation of the patella. In Europe the procedure of Roux with various modifications has been most widely used. This operation, which involves transplantation of the entire extensor apparatus of the knee joint and replacement of the patella in its correct position, leaves a considerable defect in the



## INTERNATIONAL ABSTRACT OF SURGERY

external capsule of the joint. Many methods have been proposed to close the defect. The authors employ the method of Alf Kroghus as modified by Lecomte. Their technique is in effect a combination of two operations, the procedure of Roux followed by the Lecomte modification of the Alf Kroghus operation. It consists of the following six steps: (1) incision and the formation of a cutaneous flap (2) complete liberation of the patella (3) the formation of a capsular and muscular flap by the Alf Kroghus-Lecomte method (4) fixation of the anterior tubercle of the tibia in such a way that the axis of extension and flexion of the knee is correct and plastic operation in which the capsular and muscular flap is passed above the patella to hold it and is used to repair the defect in the external capsule and (5) hemostasis and closure of the wound. Postoperatively the wound is frequently and carefully dressed to maintain the vitality of the cutaneous flap. The leg is immobilized in a light apparatus that permits frequent dressings. Care is taken

to avoid continuing the immobilization too long. Passive movements are begun by the tenth day if the condition of the skin flap is good, and are followed by active movements without weight bearing. Walking is begun between the twentieth and thirtieth days in this way stiffness of the joint is prevented.

The operation should be done when the dislocation begins to cause definite functional disturbances and before arthritis develops. As a rule definite functional symptoms are not noted before the age of eight years.

The authors report five cases in which they performed their operation. The patients are children eight and eight and a half years old respectively. At the time this report was written, six and three months respectively after the operation, both of the children were walking easily although some anatomical abnormalities persisted. In one case the gait was entirely normal. In the other there was a slight external rotation, but this was gradually disappearing.

ALICE M. MISTRA, M.D.

# SURGERY OF THE BLOOD AND LYMPH SYSTEMS

## BLOOD VESSELS

Curtillet, E. Migrating Intravascular Projectiles  
(Les projectiles intra-vasculaires migrants) *J de chir*, 1934, 44 715

The authors report a case of migrating intra-vascular projectile, review the literature, and discuss the history, mechanism, pathological anatomy, clinical features, and treatment of this form of embolism.

The case reported was that of a man who had shot himself in the epigastrium with a revolver in an attempt at suicide. Because of the patient's state of profound shock and the absence of the usual signs and symptoms of intraperitoneal damage, expectant treatment was given. A roentgenogram revealed the bullet at the level of the head of the left femur. In the course of a few hours paralysis of the left lower extremity developed. On the basis of the single roentgenogram the bullet was assumed to be located in the gluteal region. Following the development of abdominal rigidity laparotomy was performed. After repair of a wound of the liver no other source of hæmorrhage could be found and the absence of a retroperitoneal hæmatoma seemed to preclude the possibility of a vascular lesion. Recovery from the operation was uneventful. In addition to the paralysis of the leg there was total insensibility to pain extending medially up to the level of Hunter's canal and laterally to the calf of the leg. This was bordered by a zone of hypæsthesia two fingerbreadths wide. Loss of tactile sensation was more discrete. During the following days the paralysis and sensory disturbances gradually regressed. The patient left the hospital on the twenty-seventh postoperative day suffering simply from weakness of the leg. Three weeks later he returned because of lancinating pain in the leg and a sluggish burn on the dorsum of the foot. Roentgenograms made at that time revealed the bullet in Scarpa's triangle where it could also be palpated. At operation under local anæsthesia the bullet was found within the femoral artery at the level of the deep femoral artery. Here the vessel was hyperæmic and swollen. The bullet was removed and the artery sutured. Recovery was uneventful. A month later the sensory disturbances had disappeared completely, the burn had healed, and only a moderate muscular weakness remained.

The first case of this nature recorded in the literature was reported by Hammick in 1840 before the Royal College of Surgeons. The second was a case seen by White and reported by Bland Sutton in 1852. The third case was reported by Schloffer in 1903. Since then the condition has been reported more frequently, largely because of the World War

It was discussed from various aspects in the theses of Forthomme and Fritsch published respectively in 1918 and 1920 and in recent articles by Achard and Binet, Pielehevre, and Martin.

In thirty-four collected cases the bullet entered the circulation through the heart, one of the large arteries or large veins, or the superior longitudinal sinus.

According to one theory, a bullet will remain in a vessel only if the wall of the vessel opposite the perforation is in contact with bone. However, reports show that this is not always the case and it is possible to assume only that the bullet passes through one wall with insufficient force to penetrate the opposite wall. According to another theory, the penetration of the vessel wall is only partial and the blood current, by tilting the bullet, causes it to fall into the lumen.

The migrations of the bullet are extremely variable. When projected into the greater circulation through a wound in the heart or aorta, a bullet finds its way most often into the left common iliac (ten of fifteen cases), less often into the right common iliac artery (four of fifteen cases), and rarely into other branches (the axillary branch, one case in fifteen).

In the venous system gravity determines in some measure the migrations of the projectile. The bullet usually enters one of the venæ cavæ and after several days reaches the heart. In one case it entered the right auricle and later was found in an iliac vein. In another, it passed from the subclavian to lodge in the inferior vena cava by way of the right auricle. Grandgérard saw a bullet pass from the right auricle to Scarpa's triangle and then to the iliac fossa. In a case reported by Walcher a bullet entered the superior sagittal sinus, passed into the lateral sinus, and lodged in the jugular foramen. Rarely, a projectile reaches the pulmonary circulation through the right heart or reaches the left heart after having entered a pulmonary vein.

When a projectile enters the right ventricle it usually remains there. When it enters the left ventricle it is expelled by the ventricle into the general circulation.

Unless the heart is reached, projectiles in the venous circulation cause few or no signs whereas projectiles in the arterial system promptly act as emboli and should be treated as such.

The clinical signs of intra-arterial projectiles are those of embolism, namely, sudden pain in the leg with cyanosis, coldness, and usually paralysis and loss of sensation. The subsequent development of gangrene depends upon the condition of the arteries and whether propagation of a thrombus occurs. Trophic ulcerations are common.

## INTERNATIONAL ABSTRACT OF SURGERY

Projectiles in the right heart give rise to precordial pain which is increased by movement (Duvall and Barnaby 1918) or to sensations of oppression and impending death with facial pallor (Debeyre, 1918). When they are discharged into the lung the usual signs of pulmonary embolism appear.

The prognosis of intravascular projectiles is difficult to establish. In the cases reported the mortality was about 50 per cent, but except in one case in (Fry's case cited by Bland Sutton, p 9) the deaths were unrelated to the migration of the projectile.

The treatment of arterial embolism is arteriotomy or ligation and resection of the involved segment (Leriche) if the arterial wall is damaged.

Projectiles in the venous system should be promptly removed because of the danger that they may reach the heart. In the interval before treatment the patient should be prevented from lying in completely recumbent position. After the projectile has reached the right heart the surgeon is powerless. Attempts at removal have always been fatal (Debeyre, 1918). ALAN R. F. DE GROOT M.D.

Contiades, X. J. and Neulen, J. Results of Arteriography in Diseases of the Arteries and some of the affections of the Arteries and some of the affections of the Arteries and some of the affections of the Arteries. *Ann. Par.* 1914 N. 91 806.

The study of arteritis by arteriography is only one of the possible uses of this new procedure. Arteriography may prove to be of value as a general diagnostic method. Its technique has been perfected to a high degree by Reynaldo Dos Santos, but the contrast medium remains to be discovered. At the present time two types of substances are used: (1) organic iodine preparations such as iodolectan, ardiol, and tenebryl; the injection of which is painful and necessitates the induction of which is painless and can be accomplished by simple intracutaneous puncture. In the forty cases in which the authors have used thorotrast they have noted no ill-effects. However thorotrast is not promptly eliminated and because of its slight radio-active property may eventually have an injurious effect. For this reason caution is indicated in its use.

In this article the authors discuss the use of arteriography only for the study of some arterial diseases, and the study of some arterial diseases.

In aortic arteritis the extent and degree of the vascular lesions vary from case to case. However in examination of the roentgenograms one is struck by the diffusion and bilateral distribution of the lesions. Both the principal arteries and collateral vessels are involved. The arterial image loses its regular contours and curves, becomes tortuous, and shows a varying opacity. In parts, the lumen of the vessel is constricted to a thread or completely obliterated. Below the site of a complete oblitera-

tion only the collateral circulation ensures blood supply to the limb. Arteriography reveals also the frequency of the segmental obliteration of the lumen to which Leriche and others have called attention and below which the vessels again become permeable.

Arteriography is of special importance in the demonstration of collateral circulation. In studies of the circulation of the limbs it yields information as to the toxicity of the vascular wall. Failure of injection signifies functional failure but not necessarily anatomical obliteration.

The authors have compared their arteriographic findings in ten cases with the findings of other methods of exploration such as occlusometry and intensive obstructions in the thigh and leg. Occlusometry revealed only one important factor, namely abolition of pulsations in these two parts of the limb. However, this may occur in very different conditions for example with gangrene or when lateral circulation is perfectly compensated by collaterals. Occlusometry gives no information as to the condition of the collateral circulation or the trophic condition of the limb. The results of the cutaneous vasodilatation test are not always reliable as active vasomotor response.

The information obtained by arteriography with regard to the circulation of the limbs includes: (1) the existence and site of arterial obstructions; (2) the extent and distribution of arterial lesions; and (3) the condition of the collateral circulation. Without doubt, the many facts revealed by arteriography with regard to the circulation and vascularization of the limbs will be of aid in therapeutics. In the majority of arterial lesions are very diffuse, conservative methods are rarely indicated and have an unpleasant prognosis. In such cases arteriography is the most accurate anatomical operation in adequately nourished tissues.

In a case of embolism in two primary iliac arteries the authors were able to locate the site of the embolism accurately by means of arteriography. Such localization is an important aid in the determination of the site of intervention. In certain cases the method may be of aid also in the diagnosis of arterial aneurysms, in which occlusometry and the vasodilatation test have proved inadequate. By correct localization of the embolus the surgeon is enabled to choose a direct route of approach to the site of involvement and thus avoid injury to important vascular regions and save the patient's strength.

Arteriography may be found of value also in the differentiation between arterial embolism and pseudo-embolic obliterating arteritis. In arterial pseudo-embolic obliterating arteritis the arterial image is often progressive. In embolism, collateral circulation requires a certain length of time to become established. In pseudo-embolic arteritis, on the

other hand, the progressive course of the disease permits the establishment of a collateral circulation before the symptoms of sudden obliteration develop and may demonstrate other lesions of an arteritic type.

The authors report the findings of arteriography in three cases of tumor of the soft tissues (a myxosarcoma of the arm, an endothelioma of the humeral vessels, and a sarcoma of the thigh), a case of myeloplaxoma of the tibia, and a case of tumor of the adrenal cortex. They state that in cases of tumor of the soft parts arteriography does not give sufficient information to obviate the necessity for biopsy in doubtful cases. Therefore its value is quite limited. In their case of tumor of the adrenal cortex it showed the vascularization of the neoplasm very clearly. The irregular and angular conformation of the arteries and the presence of ventable pools of blood led to the suspicion of malignancy.

In conclusion the authors state that while arteriography does not yield reliable criteria of malignancy in cases of tumor of the soft parts of the limbs, they believe that aortography will prove to be a very valuable method for determination of the topography and nature of certain tumors occurring in the abdomen.

EDITH SCHANCHE MOORE.

Koukline, N. Problems of Etiology, Clinical Findings, and Treatment in Endarteritis Obliterans (Problèmes d'étiologie, de clinique et de traitement de l'endartérite oblitérante). *Rev de chir*, Par, 1934, 53 639.

In the course of the past seven and a half years the author has seen seventy cases of endarteritis obliterans. This disease develops in young persons with a labile vasculonervous system as the result of various exciting factors such as cold, intoxication from tobacco or lead, trauma, and infectious diseases. Buerger's form of obliterating endarteritis is more frequent than is generally believed and sometimes begins suddenly and progresses rapidly. In the author's cases of this condition blood cultures were negative.

In obliterating endarteritis the blood pressure is normal or lower than normal, the viscosity and coagulation time of the blood are increased, and the number of thrombocytes is decreased. Oscillometry is a valuable method of examining the arteries. It shows the nature of the lesion, the functional capacity of the vessels, and the upper limits of the disease process. In the great majority of cases capillaroscopy reveals primitive, undifferentiated capillaries and a spastic-tonic condition of the vascular system.

Of the conservative methods of treatment, diathermy and sulphur baths give the best results. The treatment of choice is bilateral lumbosacral sympathectomy (the Diez-Lampert operation). The indications for operation are based on the findings of oscillometry and capillaroscopy, by means of which a differential diagnosis can be made between organic and functional disturbances.

The results are best when the operation is performed early in the disease. Of the author's cases which were under observation for a period of three and a half years after the Diez-Lampert operation, good results were obtained in 84 per cent. The results are improved by bilateral removal of the lumbar and sacral sympathetic ganglia. Koukline performed an amputation in eighteen (26 per cent) of his cases, but in recent years has amputated much less frequently. In endarteritis obliterans, circular amputation is the method of choice. Amputation is indicated when gangrene extends to the anterior part of the foot, the patient is very emaciated, and other methods of treatment have failed.

The prognosis depends very much on the kind of life the patient leads after the operation. Cold, the use of tobacco and alcohol, trauma, the wearing of too tight shoes, and infections should be avoided.

AUDREY GOSS MORGAN, M D

Herrmann, L. G., and Reid, M. R. Passive Vascular Exercises. The Treatment of Peripheral Obliterative Arterial Diseases by Rhythmic Alternation of Environmental Pressure. *Arch Surg*, 1934, 29 697.

After a review of the history of the use of active and passive vascular exercises, the authors describe the mechanical features of the Pavaex apparatus which has been constructed for their use in the Vascular Disease Clinic of the Cincinnati General Hospital. A simpler form of this apparatus is now being manufactured commercially for use in the home, office, and small hospital.

The authors state that all therapy for obliterative vascular disease should be directed primarily toward the establishment of a collateral circulation of sufficient magnitude to furnish proper nourishment to the distal portion of the extremity. Rhythmic alternation of the environmental pressure about an extremity can be brought about automatically by the Pavaex apparatus. Treatment with this apparatus is essentially a mechanical means of performing passive exercises of the vascular system. In cases with marked obliteration and impending gangrene of the distal portions of the extremity it is necessary to hospitalize the patient and give 4 or 5 treatments every day until the circulation of the foot shows definite signs of improvement.

Up to July, 1933, a total of 3,769 treatments with the Pavaex unit had been given. In the cases of the 51 patients whose cases are reviewed in this article over 3,000 treatments were given. While calorimetric evidence of an increase in the circulation in the distal parts of the extremities occurred in all of the 51 cases, 13.73 per cent of the patients received little or no relief from their symptoms. Forty-four (86.27 per cent) of the patients were greatly benefited.

The authors are of the opinion that if a permanent increase in the circulation is to be established the treatment must be carried out over a period of many months.

HERBERT F. THURSTON, M D

Montemartini, G.: An Experimental Contribution to the Surgery of the Inferior Vena Cava (Contributo sperimentale alla chirurgia della vena cava inferiore) *Paediatrica* Rome, 934, 4, 593

Successful resection of a portion of the inferior vena cava was first done in 1893 by Bottini during the removal of prevertebral tumor. Bottini's method as gradually adopted, but the outcome as not at all favorable. The patient survived only when conditions favored the formation of an adequate collateral circulation. When ligation was done suddenly complications invariably supervened.

In experiments on dogs, Montemartini found that when the inferior vena cava, as ligated below the renal veins, the animal survived. As ligated below the iliac anastomosis was followed by nitrogen retention of intermediary products of urea metabolism, uric acid and chlorides. Hypertension and glycosuria also occurred, and the urine contained bile pigments and casts. The disturbance of hepatic function and transitory renal impairment suggested by these findings were demonstrated by histopathological studies.

Ligation of the vena cava above the renal veins as followed by anuria, urea retention, and hyperglycemia. Its death in from six to eight hours. The histological findings included degenerative processes in the kidney, and liver, and in the spleen and the mucosa and submucosa of the small intestine, and tendency toward pancreatic degeneration. The latter however may have been due to post-mortem autoinfection.

When the ligation was done between the liver and the diaphragm, it was followed by hyperglycemia, an increase in the blood nitrogen, and death in from ten to thirty minutes. The spleen, liver, and small intestine showed edema but no degenerative changes.

Temporary occlusion of the vena cava above the renal veins over a period of from fifty to ninety minutes led to hyperglycemia with nitrogen retention lasting about five days. With cessation of the anuria in twenty-four hours the phenomenon of retention subsided, there was considerable output of urea, ammonia and amino acid nitrogen, no acid, and chlorides, and erythrocytes and casts appeared in the urine.

Marked stenosis of the vena cava above the level of the renal veins caused acute symptoms of retention accompanied by purpuric mottled degeneration of the kidneys and liver followed by death. A less marked stenosis there as shown by death. A less marked stenosis there as shown by death. A less marked stenosis there as shown by death.

Lateral anastomosis of the vena cava above the renal veins as followed by the usual transitory disturbance, but rapid return to normal.

Ramón E. Sances, M.D.

Hocana, J.: Thrombosis of the Deep Veins of the Lower Leg Causing Pulmonary Embolism. *New England J. Med.* 934, 903

The author describes form of venous thrombosis which begins as local process in the normal non-anastomotic deep veins of the lower leg and frequently

leads to fatal pulmonary embolism, but may be recognized in its early stages and cured.

This deep peripheral venous thrombosis runs a peculiar course. It begins with variable amount of discomfort in the calf, swelling of the ankle, and pain rest in bed, but reappear over and over again following use of the leg. It is hard to believe that as the result of elevation for only a day or two a leg which is the site of an extensive deep thrombosis can become so nearly or completely normal in appearance. At autopsy in fatal cases a remarkably wide spread thrombosis of the vessels among the anastomoses of the calf of the leg has been demonstrated. In every case the femoral vein was unobstructed. In the cause of death was the detachment of considerable fragment of an enormous long inactive thrombus which had been lying in the blood current.

The author emphasizes that other forms of thrombophlebitis are different from this fatal form. It is related to diseased veins is more common. The reaction is usually limited to the region of the vein and the leg as a whole is not involved. The clot is usually quite soft and is rarely detached.

Migrating thrombophlebitis is usually associated with thromboangiitis obliterans, usually superficial, and never followed by extensive thrombosis or swelling of the limb. Thrombophlebitis of the milk pipe type phlegmasia alba dolens, is primarily a pelvic process though the thrombosis may extend peripherally for a long distance. The whole leg is swollen. The swelling may persist from week to several months and is little affected by rest in bed. There is also tenderness over the deep vessels at the groin. The superficial veins may be hard or dilated because of acting as collateral circulation. The process is inflammatory because the process is retrovenous sheath which renders the thrombus adherent.

The explanation of the peculiar behavior of peripheral thrombosis in the calf depends somewhat on anatomical and somewhat on chirophysiological factors. Among the muscles of the calf there is a large network of veins all of which drain into a few large veins, the knee. During rest, when the calf muscles are put into use they act as pumps for full-capacity circulation. Because of the anastomosis of the network, extensive thrombosis may be present but not manifested because the leg is not in active use. The progress of thrombosis in these stagnant parts stops only when the thrombus meets a strong current or empty vessel and yet filled with blood. When the free end of the thrombus touches the current of larger vein, it is unlikely to become fixed to the healthy wall of the vein particularly if the current is rapid, but becomes dangerous propagating thrombus. In addition the spreading action of the calf muscles always

threatens to push the end of a long clot into a larger vein at one point or another

The author reports four cases. Two of the patients, who had an extensive old thrombosis in the muscles of the calf of the leg, died of pulmonary embolism. In no case were there any signs or symptoms suggesting phlegmasia alba dolens. In three cases the disease began after a trifling injury, and in one case with signs of acute arthritis. In one case ligation of the femoral vein in the groin was followed by prompt recovery.

Although some patients may recover under treatment by immobilization or perhaps only rest in bed, the author recommends ligation of the femoral vein as soon as the diagnosis is made to obviate the danger of embolism. The point of election for the ligation is just distal to the entrance of the saphenous vein but proximal to the profunda, where the great saphenous will act as a collateral.

MAURICE MEYERS, M D

#### BLOOD, TRANSFUSION

Jones, H W, and Tocantins, L M. The Treatment of Hæmophilia. *J Am M Ass*, 1934, 103: 1671.

The authors state that, in view of the prominence of the hereditary character of hæmophilia, an effort should be made to control the spread of the condi-

tion by eugenic methods. However, in certain cases, the occurrence of hæmophilia is familial.

The number of children in a hæmophilic family is considerably greater than that in the average American family.

Prophylaxis of attacks of bleeding is attained by the avoidance of trauma and by proper preparation of the subject before he is subjected to operative procedures.

The best method for the prevention and treatment of acute attacks of bleeding is the intravenous transfusion of unmodified blood. Citrated blood has a similar effect, but has been found by the authors to cause reactions more frequently. The intramuscular injection of whole blood has seemed to benefit some patients. Fresh serum is a satisfactory local hæmostatic agent.

Therapeutic measures which diminish the venous clotting time and do not lessen the bleeding or which increase the bleeding should be avoided.

The use of special diets and of endocrinotherapy has been disappointing.

In the cases of three of the authors' hæmophilic patients, two of whom were going through an acute phase of bleeding, intradermal injections of anti-human platelet serum were followed sometimes by a marked decrease of the venous clotting time but did not cause prompt and permanent cessation of the bleeding.

HOWARD A McKNIGHT, M D

# SURGICAL TECHNIQUE

## OPERATIVE SURGERY AND TECHNIQUE; POSTOPERATIVE TREATMENT

Elison, E. L., and McLaughlin, C. Postoperative  
Wound Complications. *A Surg* 934, oo

The authors have made a detailed clinical study of the postoperative wound complications which occurred on Surgical Service C of the Hospital of the University of Pennsylvania during the eleven year period from September 1924 to September 1935. Of 9,55 general surgical operations, 10,397 wounds resulted in imperfect closures, 851 (8.1 per cent) resulted in imperfect closures. The imperfect closures were classified as of Types A, B and C. Wounds of Type A are characterized by serum collection or minor hematoma which do not delay convalescence or in any way interfere with the integrity of the wound or materially interfere with the healing process. Wounds of Type B are those with rupture or infection impairing the end-result or causing death. Wound complications of Type A constituted 7.6 per cent of the total number reviewed. They are most frequent following operations for gastric and duodenal ulcer in which either paramedian or posterior midline incision was made and the wound as closed by suture. In cases of herniorrhaphy they occur 5.9 per cent. The serum collections usually appear between the fifth and eighth postoperative day. The temperature rises to between 99 and 100 degrees F and along the line of the incision there is an area of softening from which serum exudes. The affected area is probed. Healing occurs rapidly after debridement. They occurred most frequently after herniorrhaphy and appendectomy. They are characterized by reddish inflammatory reaction about one or more skin sutures. The organisms are reviewed clinically evidences of infection were present before the sixth postoperative day. The cases are treated by section of the skin sutures, removal of the pus, and application of hot wet dressings, and if necessary aspiration of the wound edges. Convalescence was prolonged by an average of 10 and three-quarters days. The incidence of postoperative wound complications of this type are (1) mass fixation of fat, (2) the use of an excessive amount of catgut, (3) large lumps, (4) unnecessary numerous stitching, (5) infection by the scalpel used to make the skin incision, (6) infection carried by the operating room personnel, and (7) inadequate protection of the wound edges during removal of the pathological focus.

Wound complications of Type C constituted 1.3 per cent of the total number reviewed. The incidence of grave wound infection was highest after operations on the extremities. It was particularly high in the cases of diabetes. The treatment consisted of immediate removal of all skin sutures and wide exposure of the wound edges. The organisms found most frequently on culture was the staphylococcus.

Among the possible causes of wound rupture are (1) improper closure of the incision, (2) too early debridement of the wound, (3) overzealous use of carbon dioxide, (4) unusual early postoperative drainage due to such factors as vomiting, coughing, or distention, (5) early dissolution of the suture material, (6) wound infection, and (7) age, debility and cachexia. In the cases reviewed, wound rupture was most frequent after operations on the duodenum and jejunum. In 80 per cent the rupture occurred between the fifth and seventh days after the operative complication such as severe respiratory distress, or intestinal distention, or some other post-operative complication. The clinical manifestations were early bulging of the wound, bloody discharge, through-and-through striae, and the wound edges were found as they often lead to strangulation of the returned to the use of fine silk. In their treatment of wound rupture the wound edges and the surrounding edges are painted with 1 per cent aqueous mercuric chrome. The incision and the surrounding edges are closely approximated with narrow strips of tanned adhesive tape. Secondary strips of adhesive tape are placed as soon as the patient has recovered from the immediate shock of the wound rupture. In cases so treated the mortality was 3 per cent. While the incidence of death was particularly high, the authors prefer the former procedure as they believe the major problem is to get the patient safely over the immediate crisis with the least interference.

Moore, U. Dwyer, F. F. and McFarland, E. M.  
Postoperative Evacuation. *A Surg* 934, oo  
The authors review forty four cases of postoperative evacuation. 150 per cent the evacuation

followed an operation for appendicitis. Only 20.4 per cent of the total number of patients were over fifty years of age. Eleven of the incisions were made in the upper portion of the abdomen, sixteen were made in the midline, six were McBurney incisions, and the rest were miscellaneous incisions. In one case the evisceration followed the repair of a direct inguinal hernia in an obese female. The anaesthesia and the length of the incision were not regarded as of much importance in the causation of the evisceration.

In thirty-nine of the cases the incision was closed with a continuous suture of catgut, in three, with an interrupted suture of catgut, in one with an interrupted suture of linen, and in one with an interrupted suture of silk-worm gut. The authors conclude that rupture of the wound is possible following the use of any type of suture material and any type of closure, including the use of retention sutures. Secondary closure was done immediately in thirty-six cases. In eight cases it was deferred—in six, because of gross infection and in two for reasons not apparent. The mortality in the forty-four cases was 26.25 per cent. It appeared to have no relation to the type of secondary closure.

The authors suggest more general adoption of the silver-wire technique devised by Reid.

ROBERT ZOLLINGER, M D

### ANÆSTHESIA

Cardia, A. Clinical Observations on the General Reactions of the Body to Ether Inhalation. *Anæsthesia* (Osservazioni cliniche sulle reazioni generali dell'organismo all'anestesia eterea per inalazione) *Ann. ital. di chir.*, 1934, 13, 745.

The author believes that consideration of the effect of ether anaesthesia should include a multiplicity of factors. In the cases of thirty-two patients with various maladies he studied the blood and urinary changes for a five day period before and after operation performed under ether anaesthesia induced by inhalation. His findings were as follows:

1. The quantity of urine was decreased in the majority of the cases immediately after the intervention (first two to three days) and then returned to the pre operative state.

2. In thirty-one cases the urea increased. The increase seemed independent of the quantity of the anaesthetic and directly proportional to the type of disease and the gravity of the intervention.

3. Of twenty-five cases in which the non protein nitrogen was studied, twenty three showed an increase. The increase was independent of the quantity of anaesthetic used and in direct proportion to the type of intervention or the disease process. In hepatic and renal affections the increase was more marked.

4. The red blood count, hæmoglobin, and color index varied to such a degree that no conclusion was permissible. However the intervention seemed to have a complex influence, in some instances stimu-

lating and in others depressing the hæmatopoietic system.

5. In twenty-one of the thirty-two cases the white blood count was moderately increased and there was a moderate neutrophilia. However, these changes showed no relationship to the quantity of ether or the type of the disease or intervention.

The author concludes that there was no evidence of a deleterious influence on the body that could have been attributed directly to the ether anaesthesia, and that when changes occurred they were better explained by the nature of the malady or the relative gravity of the operation. CLARA RAVEN.

Killian, H. The New German Evipan-Sodium. *Anæsthesia* *Anes. & Anal.*, 1934, 13, 177, 226.

Evipan sodium is the sodium salt of evipan, i.e., of N-methyl- $\alpha$ -cyclo-hexenyl-methyl-barbituric acid. The intravenous injection of a 10 per cent solution produces a short surgical anaesthesia. The duration and depth of the anaesthesia depend upon the quantity of the drug employed and the rate at which it was injected.

The average period of anaesthesia is from twenty to thirty minutes in length. Three or four cubic centimeters of the solution are injected during the first minute, and anaesthesia is induced almost at once. Three or four additional cubic centimeters are then injected fractionally at intervals at such a rate that the respiration and the color of the skin are not materially modified. Patients with diabetes or disease of the heart, lungs, liver, or kidneys show no ill effects after this form of anaesthesia. Doses of from 3 to 5 c.c. are recommended in place of ethyl chloride for short surgical procedures and also for the induction of anaesthesia before the administration of ether, nitrous oxide, or chloroform for surgical procedures requiring fairly long periods of time.

Following the injection of evipan sodium the respirations first become slower and deeper. Subsequently there is a decrease in their depth often accompanied by a slight transient cyanosis. The modification of respiration is therefore the best guide to the amount and speed of the injection. The blood pressure falls during the injection and generally quickly returns to a level from 5 to 15 points below the original level. With the fall in the blood pressure there is a slight increase in the pulse rate. As a rule the more quickly the injection is made the more marked are the changes in the blood pressure and pulse rate.

The pupillary signs are also of importance as an indication of the depth of anaesthesia. Moderate pupillary dilatation with a positive reaction to light indicates safety. Wide pupillary dilatation with fixation to light indicates danger, especially when other signs such as a marked change in the patient's color and depression of the respiration are noted.

According to the author's experience, excitement during the stage of recovery is rare, transient, and mild. Postoperative vomiting has occurred in fewer than 5 per cent of cases.



Muscular relaxation is greater than in full ether anesthesia and approaches that produced by avertin. Relaxation of the jaw and pharyngeal musculature occurs quickly and care must be exercised to maintain an adequate airway. Because of the fact that in the cases of patients who are very ill as little as 0.5 c.c.m. of evipan sodium solution may produce deep anesthesia, great care must be exercised to avoid pushing the injection too rapidly in the cases of such patients. Over-dosage can usually be quickly remedied by the intravenous injection of coramine in doses of from 5 to 10 c.c.m.

On the basis of experimental work the author believes that the use of evipan sodium should be restricted in the cases of patients with a diminished respiratory surface or other impairment of ventilation, a subnormal condition, or a severe liver affection. He states that in the reports of 25,000 cases in which evipan sodium was employed, only 1 death was recorded. *ANNALS & W. TOWSON M.D.*

Menegaux, G., and Secheval, L. A Critical Study of General Anesthesia Induced with Evipan Sodium (*Etude critique de l'anesthésie générale à l'évipan sodique*). *J. de méd.* 934, 44 1935

For approximately ten years evipan sodium, barbiturate, has been used in several countries, particularly Germany for the induction of anesthesia. It is given intravenously and its advocates have claimed that it produces complete and agreeable anesthesia free from danger.

In review of the literature the authors found nearly 200 reports of experiences with this anesthetic covering about 25,000 cases. They discuss the chemistry of the product, give its structural formula, and tabulate the results of animal experiments showing the amount necessary to produce hypoxia, anesthesia, and death.

Evipan sodium is rapidly destroyed in the body, probably by the liver. Its action as a general anesthetic is therefore comparable to that of gas. Perfusion given intravenously is destroyed and disappears from the blood stream much more slowly. Avertin given by rectum requires longer time to reach its maximum effect and is eliminated slowly.

Evipan may be injected into one of the veins at the elbow or into the saphenous vein. The solution is made by dissolving 0.5 gm. of the dry powder in 10 c.c.m. of distilled water and shaking thoroughly.

The authors recommend that not more than 0.5 c.c.m. be given at one time although the literature shows that some anesthetists have given as much as 6 c.c.m. Several methods of determining the dose have been tried. The authors are of the opinion that a mathematical formula is impossible and that therefore the dosage must be determined from the reaction of the patient during the course of the injection.

It is generally recommended that the injection be given at the rate of 1 c.c.m. in from ten to fifteen seconds. The authors give the first cubic centi-

meters (to the point of sleep) at the rate of 1 c.c.m. per minute and the rest at the rate of about 1 c.c.m. per thirty seconds. The rate must be increased in the cases of robust subjects and reduced in those of weakened or tired persons.

If the operative procedure is lengthy repeated injections may be given at the slightest sign that the patient is awakening. The authors have given 18 c.c.m. in 9 injections over a period of an hour and a half and others report using as much as from 30 to 40 c.c.m. There does not seem to be any contraindication to the pre-operative administration of an opiate if this is desired.

During the injection the patient loses his usual color or only slightly livid. There is perhaps slight cyanosis of the lips. Pallor is an indication of impending trouble.

Paralysis of the muscles of mastication and abolition of the corneal reflex are constant in all cases. The reaction of the pupil to light is variable. The pulse and blood pressure are little changed. The respiratory rate falls with diminution of amplitude until the trauma of operation causes it to rise to normal or above.

The induction of anesthesia falls completely in only about 5 per cent of the cases and the anesthesia is relatively poor in only from 5 to 10 per cent.

The patient begins to awaken from fifteen to thirty minutes after the termination of the injection. Postoperative vomiting is uncommon and painless. Any complications are extremely rare.

Respiratory stimulants (coramine, strychnine, caffeine) are indicated when there is evidence of impending respiratory failure.

The chief contra-indications to the use of evipan sodium are peritonitis, pneumonia, grave septicemia, and hepatic insufficiency. The authors regard anesthesia induced with evipan sodium less dangerous than chloroform or spinal anesthesia and about as safe as ether anesthesia.

They review 40 non-fatal accidents during anesthesia induced with evipan sodium and 23 cases in which death occurred. An extensive bibliography is included.

MAURICE W. POORE, M.D.

Livingston, E. M., Emory, R., and Lieber, H. Evipan Sodium: A Short Intravenous Anesthetic. *Am. J. Surg.* 924, 26 1936

Evipan is barbituric acid derivative which when administered intravenously induces surgical anesthesia lasting for from five to twenty minutes. It acts like the first morphine causing immediate general muscular relaxation. There is no preliminary excitement or struggle. The pulse is slightly increased, and there may be a fall of from 5 to 10 mm. in the blood pressure. After termination of the anesthesia there is no postoperative nausea, vomiting, or excitement. The lethal dose is 4 times the anesthetic dose, the margin of safety therefore being wide. Detoxification is accomplished very rapidly in the liver and is practically complete on termination of the anesthesia.

Evipal sodium anaesthesia is contra-indicated in severe liver disease, grave infections of the upper respiratory passages, and involvement of the respiratory center

The Medical Research Council of London reported only 1 fatality in 25,000 evipal anaesthetics. The drug is sold in sterile 1-gm ampoules. It is dissolved in 10 c cm of sterile distilled water and given slowly, the injection taking about one minute. From 3 to 5 c cm of a 10 per cent solution will produce anaesthesia lasting for from five to ten minutes, and from 6 to 10 c cm (the maximum dose), anaesthesia lasting for from fifteen to thirty minutes. The patient should first be prepared, and the surgeon should be completely ready to begin the operation when the dose has been administered. No preliminary medication should be given. The use of evipal is not contra-indicated by the previous ingestion of a meal. The character of the surgical operation is limited by the duration of the anaesthesia (twenty minutes). The authors have employed evipal in 280 cases for a wide variety of surgical procedures ranging from appendectomy and herniorrhaphy to the common minor surgical operations. The patients ranged in age from two to eighty-eight years and their general condition ranged from good to poor.

BENJAMIN G P SHAFIROFF, M D

CoTui, F W Further Studies in Subarachnoid Anaesthesia *Anes & Anal*, 1934, 13 183

From studies made on dogs following the induction of subarachnoid (spinal) anaesthesia with

novocain, the author draws the following conclusions

1 Vomiting associated with spinal anaesthesia is probably due to stimulation of the vomiting center by upward spread of the drug from the spinal canal. It is to be considered a danger signal.

2 Spread of the drug into the spinal canal is governed by at least three factors. These are (a) gravitational flow, (b) leveling, and (c) molecular diffusion perhaps assisted by the normal spinal pulsations.

3 In the head down position an animal is killed by less than one half the dose that would be required to cause its death in the horizontal position.

4 It is possible that, in man, the curvature of the spine favors gravitational flow into the thoracic cavity.

5 The respiratory center is much more vulnerable to novocain than are the phrenic nerves.

6 The typical blood-pressure curve during anaesthesia shows a primary fall, an intermediate rise, and a prolonged secondary fall. The typical curve may be modified in a number of ways, the most important of which is respiratory paralysis.

7 The low blood pressure of spinal anaesthesia resembles other low blood-pressure states in having the main features of shock.

8 Infusion of saline solution fails to overcome it. Ephedrin and perhaps other vasoconstrictors seem to be the only efficacious remedies.

9 The Trendelenburg position is not only useless but also harmful. ARTHUR S W Touroff, M D

# PHYSICOCHEMICAL METHODS IN SURGERY

## ROENTGENOLOGY

Oulmby, E. H., Copeland, M. M. and Woods, R. C.: The Distribution of Roentgen Rays Within the Human Body. In *J Roentgenol* 924, 3 134

One of the first problems confronting the roentgenologist is the measurement of the actual quantity of irradiation delivered to a given tissue. The authors studied this problem by a direct comparison of cadaver and water-phantom measurements made with the same instruments and as nearly as possible, under like conditions and measurements made on living persons.

The factors used in most of the work were roentgen rays at 200 kv, a filter of 5 mm of copper and 5 mm of aluminum and target distance of 5 cm. Some of the measurements were also made with 700 kv roentgen rays and 13 gamma rays produced by a 5 gm radium pack. For the measurements on the cadaver, small collimated ionization chamber and the vacuum-tube instrument of Failla were used. The instruments were checked daily for variations. The measurements obtained with 200 kv roentgen rays are believed to be quite accurate; whereas, because of set-up difficulties, those obtained for 700 kv roentgen rays and, because of small depth dose, those obtained for gamma rays are not so accurate as might be desired.

A comparison of the back scattering readings shows that the values for the cadaver are in all cases lower than those for the water phantom. The greatest discrepancy is in the chest and jaw. The variations in the size of the irradiated field for various parts of the cadaver and the water phantom showed very close agreement.

The percentage depth doses are tabulated for 200 and 700 kv roentgen rays and gamma rays in the cadaver and water. The authors conclude that for 200 kv roentgen rays depth doses as determined in a water phantom may be used for all fields and depths in any part of the body except the chest and intracranial region. About more this slight error. Measurements in the region of the chest and mouth for depths greater than a few centimeters require a correction varying with the depth and the field. For the more penetrating rays, no serious error will be introduced by using water phantom measurements.

In eighteen living subjects, a number of measurements were made on the pelvis for 200-kv rays by inserting a cylindrical chamber into the vagina. In this series of measurements the roentgen tube was not only centered over the chamber but displaced laterally in order to obtain the distribution of the irradiation at various depths. It was found that in the living individual the values for back scattering

are between those for the cadaver and those for the phantom but closer to the latter. A comparison of surface-intensity values revealed very close agreement with the cadaver and the water phantom. The depth dosages in the human pelvis and in the water phantom showed no serious differences. This was true also of the variation of the depth dose with the size of the irradiated area.

The values for positions off the axis of the beam were sometimes slightly lower and sometimes slightly higher than those on isodose charts, but no greater discrepancies were found between the living individual and the water phantom.

The authors conclude that, with the exception of the chest and intracranial region, for which correction curves are given, surface and depth-dose values obtained by measurements in a water phantom may be safely employed as a satisfactory approximation to the true values in irradiation therapy.

EARL E. BARTER, M.D.

Hirsch, L. S. The Application of Kymocardiography to the Diagnosis of Cardiac Disease. *RadioLOGY* 924, 23 720

While it is not yet possible to determine exactly the value or all of the possible applications of kymocardiography in the anatomical, physiological, and clinical study of the heart, the author concludes from the data already obtained that the method will have a wide field of usefulness and will assist greatly in the solution of many difficult problems relating to cardiodynamics.

It contributes the following information regarding the heart: (1) the make-up of the cardiac shadow, (2) the shape of the heart as a whole and of its chambers during the various phases of movement, (3) the size of the heart in systole and diastole or at intermediate phases, (4) the characteristics of the movement of the heart as a whole or of its various chambers, (5) the activity and accomplishment of the cardiac muscle, (6) the relationship of contraction to conduction phenomena, (7) the relationship of movement to sound phenomena, (8) the character of rhythm disturbances, (9) the extent and severity of myocardial changes, and (10) the modification of the character, distribution, and time relationships of the chamber movements in valvular disease.

HENRIET T. THOMSON, M.D.

Strunoff, P. A Ray Kymography of the Heart. *Brit J Radiol* 924, 7 707

After briefly reviewing the history and principles of surface kymography of the heart the author presents an extensive and detailed discussion of the reading of kymograms. He considers the dimensions of the movements of the heart as recorded by the

waves produced and calls attention to individual variations of such movements and variations in different parts of the heart. He states that for accurate interpretation of the movements it is necessary to determine the time relations of the single movements as accurately as possible. While this determination can be made with a caliper, the author has worked out a densographic method which permits an analytical time observation of kymograms by fractions of a second. He describes the method in detail and shows its value by kymograms and densograms.

Examination of movements in the kymogram reveals the exact topographical location of a movement because of the fact that different parts of the heart and vessels show functionally different movements. It permits definite determination of the amplitude, course, and time relation of the various movements of pathological and normal hearts. In the presence of pathological variations in shape the ventricle area can be defined more exactly than in an ordinary film. Two cases presenting difficulty in differentiation which was readily cleared up by roentgen kymography are reported.

Changes associated with hypertrophy and atrophy of the musculature of the heart, pericardial disease, infarction of the cardiac wall, and beginning aneurism of the cardiac wall are discussed.

Attention is called to the difficulty in attaching pathological significance to changes in the form of the waves. It is impossible to draw final conclusions with regard to function from the general form of the ventricular movement. From all of the material examined the author is able to conclude with certainty only that in nervous heart disturbances high peaks very often occur at the beginning of the systole. In cases of weak heart, on the other hand, the waves are flattened and rounded. Very characteristic in cases of thyrotoxic disturbances is an abnormally high wave. When the myocardium is injured there is usually a step-like splintering of the movements in the left ventricle and the time relations of the individual movements are changed. The most marked change of movement forms takes place in cases of disturbances of rhythm, in which both the extent and the duration of the movements are changed.

ADOLPH HARTUNG, M D

Wintz, H., and Wittenbeck, F. The Reasons for Failures in Roentgen Therapy of Carcinoma (Gründe fuer die Misserfolge der Roentgentherapie beim Carcinom) *Verhandl. 1. international Kongr. Kampf Krebs*, 1933, 2: 1181.

Because of the numerous failures of roentgen therapy in cases of carcinoma, the authors made a statistical study of their 1,014 cases of carcinoma of the uterus to determine the essentials for optimal results from irradiation therapy. From their figures they conclude that as irradiation has yielded numerous undeniably successful results the number of failures still occurring can certainly be decreased. While the fight against cancer which has extended

throughout the body is still hopeless and the treatment of localized carcinoma in patients whose resistance has been weakened by other diseases or loss of blood is usually unsuccessful, the fiction of "radioresistant carcinoma" should be combated.

Starting from the fact that by the application of the correct dosage every carcinoma can be destroyed, investigations should be made to determine how far the biological forces of the body which eliminate the products of decomposition and upbuild sound tissues have failed, or what technical errors have occurred in the treatment. Only irradiation by which all of the carcinoma cells are destroyed will effect a cure. For such destruction 110 per cent of the skin erythema dose must be applied to the tumor and the entire area into which it may extend in cases of squamous-cell carcinoma and 125 per cent of the skin erythema dose in cases of adenocarcinoma.

As a rule failure results because this dosage is not attained or is attained only in parts of the tumor and therefore the first requirement of roentgen therapy, the destruction of the cancer cells, is not met. Even with the most perfect technique the attempt to administer the destructive dose throughout the tumor region may be unsuccessful because in continuous or fractionated irradiation the biological power of recovery of the cells is not given sufficient consideration. Failure may result also from disregard of the fact that an inflammation in the carcinoma and its vicinity alters roentgen sensitivity. Biopsy may lead to failure if it is done before the irradiation and therefore should be undertaken only after the irradiation.

As the destruction of the tumor is merely the basis for the cure and removal of the decomposed matter and cicatrization of the resulting defect are necessary, the latter must be stimulated after the irradiation. Otherwise, failure will result and healing will not occur. Statistical studies show the necessity for proper post-irradiation care.

In addition to the medicobiological reasons for failure of roentgen therapy of carcinoma there are those of a physicochemical character. The physical factors have the most important relationship to dosage. The physical phenomena occurring during irradiation—dispersion of the irradiation, and secondary irradiation—have a marked effect on the dosage in the irradiated area. Prevention of errors in dosage resulting therefrom is possible, but requires a thorough knowledge of physics. A certain amount of technical knowledge is also necessary because of the complicated nature of the roentgen apparatus. Without such knowledge defects in the apparatus or the various measuring instruments may not be recognized.

The results that may be expected from the method of treating gynecological cancer which is used at the University Gynecological Clinic and the Roentgen Institute at Erlangen are demonstrated by the results obtained in the former institution in cases of carcinoma of the uterus.

(F. A. WAHL, JOHN W. BRENNAN, M D)

## RADIUM

Senatore D'Emilio, A. R. Radi in Therapy of Bone Metastases from Carcinomas of the Breast (La radioterapia nelle metastasi ossee da carcinoma mammario) *Radiol med.* 1934, 105.

The insidious development of generalized metastases from carcinomas of the breast renders it necessary to pay close attention to every complaint of pain by women who have had breast removed for carcinoma. In the early stages, in which the condition will usually be revealed only by roentgenography, irradiation therapy may be applied with some prospect of success.

The author discusses some of the general findings of clinical study and especially the pathological anatomy of bone metastases from carcinoma of the breast. An effort to explain the rationale and the results of irradiation treatment. In the osteoblastic type of lesion the osseous tissue is gradually decreased and is replaced by primitive connective tissue. Very early the calcareous salts are decreased and there is fusion of the true bone, which is later replaced by fibillary tissue. The latter is in turn invaded by the neoplastic elements. At the periphery newly formed connective tissue separates the neoplasm from the resting bone. The degree of the invasion is of importance in the efficiency of irradiation therapy. In the osteoplastic type of lesion there is increased bone production accompanied by increased calcification, which may interfere with the penetration of the rays. The neoplastic tissue. Therefore osteoplastic lesions must be given much more and heavier irradiation. A volume of muscle is often a favorable condition for radiotherapy.

The use of radium in the treatment of osseous metastases has been neglected. The author regards radium as superior to the X rays in the treatment of secondary bone tumors. He states that it is easily and painlessly applied. With adequate filtration, only the gamma rays are used, and when the irradiation is given in prudent doses it does not cause necrosis. Necrosis occurs usually when tumors from the surrounding regions invade the bone after destroying the periosteum and the afferent nutrient arteries. Under such conditions irradiation may accelerate the process. When the metastases in the bone are embolic, irradiation arrests the tumor growth and the calcification in the bone is increased. The use of small doses over long period of time gives the best results.

The author describes his technique of radium irradiation. He has obtained the most satisfactory results from juxtapositional irradiation for from ten to twenty days, depending on the depth of the bone and the gravity of the lesion. He uses 50, 100 or 150 mgm. of radium and changes the position of the radium over the skin frequently. He reports several cases. The radium may be applied very easily in the patient's home.

In conclusion the author emphasizes the importance of the analgesic action of radium in late cases,

and states that the dangers of radiodermatitis are not underestimated. A. LOUIS ROSE, M.D.

## MISCELLANEOUS

Leib: The Principles, Application, and Results of Short Wave Diathermy (Grundlagen, Anwendung und Ergebnisse der Kurzwellendiathermie) *Zentralbl. f. Chir.* 1934, p. 300.

The effect of short wave diathermy is due to the accumulation of heat in the tissues. This occurs according to the laws of Joule. The true curative factor is an immediate active hyperemia. For the dosage at the present time we are dependent upon the patient's subjective sensations of heat.

In acute surgical infections short-wave diathermy is not the method of choice. It is dangerous to assume that short wave treatment renders surgical treatment superfluous in cases of acute infectious processes. Surgery must always be considered first (Laser). If sufficient drainage for the exudate has been provided, short wave hyperemia may hasten the healing. In cases of acute tendon sheath phlegmons, acute suppurative osteomyelitis, and acute joint suppurations, short wave treatment is contraindicated. For carbuncles, short wave treatment has been abandoned and the electric knife is now generally used. In indolent pyogenic infections, roentgen irradiation is superior to short wave diathermy.

On the other hand, the indications for short wave diathermy are being widened in all types of subcutaneous surgical infections. Tuberculosis is refractory to this treatment, whereas the stridiform form of tuberculous peritonitis, erysipelas, and subcutaneous tendon-sheath inflammations respond very well.

The widest field of application for short-wave diathermy is the treatment of joint diseases which are not of an acute inflammatory or specific nature. Injuries of the joints (after the danger of bleeding has passed) persistent irritative effusions in joints in cases of injury to the capsule, and joint effusions in the immediate neighborhood of fractures react well, as does periarthritis of the humerus and scapula. Myalgia, lumbago, neuralgia of various types, and neuritis are suitable for this form of treatment. Subacute postoperative infiltrations following plastic operations and strumectomies respond well. Fistulae following recent abdominal operations close up faster after short wave diathermy.

Short wave diathermy has no specific influence on tumors.

In the discussion of this report Hoenes reviewed experiences with short wave diathermy at the Freiburg Clinic. His attitude is very skeptical. The improvements occurred chiefly in the mild or only moderately severe cases of the various treatment groups. Some conditions—deforming arthritis, for example—became worse under the treatment. No differences were noted in the results of treatment with the vacuum-tube apparatus and those obtained with the spark gap apparatus.

REHN stated that in his opinion long-wave diathermy has not been superseded and may yield better results when it is further improved.

SCHITTENHELM stated that in two years' experience with the ultra short-wave he found that subacute inflammatory joint diseases react best, the reaction of gonorrhœal monarthrititis being especially surprising. Pneumonic infiltrations often clear up rapidly, especially those in an area near bronchiectasis. Inflammations of the nasal accessory sinuses and catarrhal affections of the upper air passages are favorably influenced. Furunculosis reacts satisfactorily, but deeper abscesses do not respond.

(RUGE) JOHN W BRENNAN, M D

Binet, L., Laudat, M., and Auclair, J. Hyperthermia Caused by Short Waves (L'hyperthermie provoquée par les ondes courtes). *Presse méd.*, Par., 1934, 42, 1917.

Dogs were given intravenous injections of chloroform and an hour later were treated with the diathermy apparatus with wave lengths of from 15 to 18 meters. Some of the animals died when the temperature reached 43 degrees C., whereas others were able to withstand that temperature and a few were able to withstand a temperature of 46 degrees C. In the cases of ten of the dogs the temperature was raised to 42 or 43 degrees C. and then lowered gradually and a study made of the blood. The latter showed a great relative decrease in the plasma

and an increase of the cells. The index of refraction was first lowered and then raised to a point higher than in the beginning. There was a slight increase of proteins. The proportion of serum to globulin was changed only slightly. The lipoids showed a slight increase, and there was a marked hyperglycemia which disappeared quite rapidly when the heat was stopped. As a rule the urea was increased. The azotemia persisted even after the temperature was lowered.

In all cases the hyperthermia was accompanied by an increase in the carbon dioxide with a consequent lowering of the alkali reserve. As dogs breathe much more rapidly under the influence of high temperatures, it might be supposed that the decrease in the alkali reserve was due to the hyperventilation. However, such a decrease occurs also in man in whom the rapidity of respiration is not increased by hyperthermia.

The chloride content of the plasma showed an increase and that of the cells a decrease. While the changes in the chloride content of the blood were less marked than those in the alkali reserve, they seemed to be related to the latter and to follow them. In man, the chloride changes are in the same direction and almost the same in amount as those in dogs.

In the case of one dog in which the urine was examined it showed progressive alkalinization.

AUDREY GOSS MORGAN, M D

## MISCELLANEOUS

### CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Bialock, A. The Influence of Exposure to Cold and of Deprivation of Food and Water on the Development of Shock. *Arch Surg* 63:4, 90 35.

In experiments on animals to determine the effects of cold and of deprivation of food and water on the minimum loss of blood necessary to cause death, loss of blood was produced in some instances by the removal of blood through a cannula placed in the femoral artery and in others by infusing the muscles.

In the experiments with regard to the effect of exposure to cold on the development of shock from hemorrhage and trauma the results are found to depend largely on the depth of anesthesia at the time of the exposure. In the experiments with regard to the effect of deprivation of food and water the animals were deprived of food and water for forty-eight hours immediately preceding the studies. The loss of blood resulting in death as found to be not much less than in experiments in which the animals were not deprived of food and water. In the experiment in which death was produced by bleeding the right of the blood removed from the femoral artery was approximately the same as the difference in the rights of the infused and injured extremities in the experiments in which death was caused by trauma.

HERBERT F. TIERNEY, M.D.

Mitchell, A. G., and Brown, E. W. The Clinical Implications of the Thymus and Scrofula Thymico-lymphatica. *J. Am. Med.* 1934, 8 669.

Statistical studies were made in the cases of 6 infants and children who, according to the findings of roentgen examination, had an enlarged thymus. The control group consisted of 8 infants and children who were free from thymus enlargement according to the same criterion. From the results the authors draw the following conclusions:

In some instances an enlarged thymus gland can cause pressure upon structures in the thoracic inlet and lead to the development of such symptoms as dyspnea, crowing respiration, cough, and cyanosis.

Other conditions are perhaps more frequently responsible for these symptoms than is enlargement of the thymus.

3. An infant or child who has some cause for dyspnea, cough, and cyanosis, such as respiratory tract infection or congenital heart disease and who has also an enlargement of the thymus is more liable to develop these symptoms. Probably an enlarged

thymus may aid in their production even when, in itself, it would be insufficient to cause them.

The authors state that, according to statistics, there is no significant association between enlargement of the thymus and pyrocytosis. There is no proof that convulsions are associated with enlarged thymus. Even in the case of a patient with an enlarged thymus the occurrence of convulsions should lead to the suspicion of increased intracranial pressure, spasmodic (tetany) or some other cause. Enlargement of the thymus demonstrable in the roentgenogram is by no means necessarily associated with symptoms. Even when obstructive symptoms are present in the case of an infant or child with an enlarged thymus, search should be made for another possible cause. The studies herewith reported offer no solution of the problem of the relation of sudden death without apparent cause to status thymico-lymphaticus. *WALTER H. NIMES, M.D.*

Ferrari, R. C. Pilonidal Cyst and Fistula (Quinta lesion dermatologica contagiosa). *Seminario Med.* 1934 4 333.

Statistics on 143 cases of pilonidal abscess are presented. In 74 cases single excision was performed. Of the wound and coccyx are excised simultaneously, in 3 sections, curettage, and packing were done. The wound remaining after excision was treated by wide open packing with iodine gauze. Of 35 cases, 13 had primary closure, 10 had healing occurred once in, and suppuration requiring drainage occurred in 21. In 21 cases partial closure and packing of the remaining part of the wound were done. In 6 cases closure as effected with the pedicled flap by Labey technique.

The best procedure for pilonidal cysts and fistulae is wide-open packing and the Labey plastic closure. When wide-open packing is done the postoperative period can be shortened by covering the wound with a fibrovascular graft. The procedure of least value is partial closure and packing of the wound. This is the treatment that causes the most marked disturbances, is followed by the slowest healing, and requires the greatest number of complementary operations.

Final results could be established in 64 cases in which the operation was performed at least one year and two months previously. A recurrence developed in 4 cases. In none of the cases in which healing occurred was there any complaint of residual symptoms or discomfort.

The author describes the findings of microscopic examination. He calls attention to the difference between true and false recurrence. In true recurrence, specific tissue of inclusion left behind in the previous excision is found. In false recurrence

the section shows only granulation tissue without a specific character

In the treatment, only complete excision is to be considered. The excision must include all of the region usually involved by the disease. It must extend down to the sacrococcygeal fascia and laterally to the origin of the gluteal muscles. Frequently it must include the coccyx.

WILLIAM R. MEYER, M.D.

Matolay, G. The Surgical Complications of Diabetes (Die chirurgischen Komplikationen der Zuckerkrankheit) *Oreskops*, 1934, 24, 737.

The surgical diseases of diabetes may be divided into two large groups, those which are unrelated to the diabetes and those which develop because of the diabetes. In both groups there are cases in which operation must be performed immediately and cases in which it may be delayed. It is generally assumed that imperative operations must be undertaken without regard to the diabetes whereas operations not absolutely necessary should not be performed even in the mildest forms of diabetes. In injuries, ileus, strangulated hernia, and perforated gastric ulcer the procedure is the same as in the absence of diabetes. However if the patient's condition permits it is best to postpone the operation for three or four hours in order to prepare the patient and to combat an existing or threatened coma. Large doses of insulin and alkalis are indicated. The possibility of hypoglycemia must be kept in mind and the blood sugar constantly watched. For the practitioner who is not always in a position to determine the blood sugar urine analysis for sugar will suffice to a certain point.

Experience teaches that in young persons operation often aggravates diabetes, even when tolerance is good and the urine contains no sugar or acetone.

In the preparation for operation excessive starvation is of no value. On the other hand, if coma is present before operation, determination of the blood sugar is indispensable for correct regulation of the diet and differentiation between pancreatic and renal diabetes.

During the postoperative management, factors which favor the formation of acetone must be eliminated. After abdominal operations, acetonuria is favored not only by operative shock but also by the loss of fluid and the unavoidable withholding of nutrition. The intravenous or rectal administration of fluids is necessary. The administration of large quantities of sodium chloride should be avoided.

Since the discovery of insulin the indications for surgery have been widened and the results of surgical treatment improved. The effect of insulin assures better and quicker healing, more rapid demarcation of necrotic tissue, and more active formation of granulation tissue.

After injury diabetes frequently develop phlegmons which have a marked tendency to spread rapidly. The fact that in the presence of diabetes

operations for ingrowing nails or corns may be followed by gangrene of the foot which often threatens life is well known. Infection and abscesses follow injections more often in diabetics than in healthy persons. Therefore great care is necessary even in the simple injection of insulin. Furuncles and carbuncles develop most frequently on the back and often spread rapidly to an enormous size. If the thinned skin over large and repeatedly incarcerated umbilical hernia becomes necrotic, severe abdominal phlegmons develop. Suppurative middle-ear infections in diabetics readily lead to serious bone necrosis, sinus thrombosis, and meningitis.

The prerequisite for good treatment of wounds is good general management. The local application of insulin hastens the healing of wounds. The most common complication is gangrene of the lower extremities. The most important cause of this condition is arteriosclerosis. Also of importance in its development is severe infection. Before the days of insulin it was the rule in cases of gangrene extending beyond the toes to perform a leg or thigh amputation. As a result of the action of insulin, exarticulation of the toes is often sufficient. Amputations should be done simply and quickly. Anesthetics favor the development of acetonuria. Chloroform is not indicated. Ethyl chloride and a brief ether rousch are less dangerous. Spinal anesthesia seems to be best for local anesthesia, novocain without adrenalin should be used. As wound infection threatens in cases of diabetes, gentleness in operating and careful hemostasis are important. A disadvantage of insulin is its tendency to cause tissue edema. A diet with a low salt content should be prescribed and the fluid intake limited.

(ILLU.) LEO M. ZIMMERMAN, M.D.

#### GENERAL BACTERIAL, PROTOZOAN, AND PARASITIC INFECTIONS

Sheplar, A. E., Spence, M. J., and MacNeal, W. J. The Therapeutic Use of Concentrated Anti-streptococcus Serum of the New York State Department of Health. *Arch. Surg.*, 1934, 29, 858.

Serum therapy of streptococcal infections has been a controversial subject almost ever since the description of the first streptococcus serum by Marmorek in 1895.

After a period in which streptococcus serum fell into disfavor, interest in it was revived by its somewhat successful application in the treatment of scarlet fever and erysipelas.

While the classification of hemolytic streptococci is still confused, there is no valid reason for distinguishing between therapeutic sera for different clinical types of streptococcal infection.

The most potent antistreptococcus serum now available appears to be the concentrated serum of the laboratory of the New York State Department of Health.

SAMUEL KAHN, M.D.



# INTERNATIONAL ABSTRACT OF SURGERY

Churchill, R. D. The Operative Treatment of Hyperparathyroidism. *A Surg* 934, 00

Churchill pays tribute to the work of Hanson, Collip, and Alford which made possible the interpretation of the syndrome due to hypersecretion of the parathyroid glands. On the basis of recent studies he suggests the following tentative classification of parathyroid diseases:

1. Generalized enlargement of the parathyroid glands due to functional hyperplasia but not associated with hyperparathyroidism (rickets, osteomalacia, pregnancy nephritis).
2. Generalized enlargement and hyperplasia of the parathyroid glands associated with hyperparathyroidism.
3. Focal hyperplasia (adenoma) of one or more parathyroid glands associated with hyperparathyroidism.
4. Carcinoma.

At the time this article was written (only one case of proved hyperparathyroidism had been operated upon) the Massachusetts General Hospital Three belonged to Group 1 and eighteen to Group 2. The author reports briefly three cases of generalized enlargement of the parathyroid glands associated with hyperparathyroidism. In all, the serum calcium was constantly elevated and the serum phosphorus low. This in all of the cases renal stones were present but this was not significant as thyroid tumors. At operation, generalized enlargement of all of the parathyroid glands as foci and approximately three fourths of the total parathyroid tissue was removed. The removal of this amount was sufficient to reduce the blood calcium and phosphorus to the normal level and to relieve the clinical symptoms.

On careful histological examination of the specimens by Castleman the parathyroid tissue was found to be formed almost entirely by large water-clear cells resembling quite closely the cells characteristic of hypernephroma. In contrast, in tumors termed adenoma, a single section may show chief cells usually somewhat larger than those of normal gland and 1 times multinucleated, oxyphilic cells in the normal gland and 1 times after clear cells arranged in alveolar like groups. The glands (termed hyperplasia) show greater vascular supply and an abundance of fat cells. Churchill believes that the discovery of one normal parathyroid gland or of an enlarged gland with the histological characteristics of an adenoma excludes the presence of generalized hyperplasia, whereas the finding of an enlarged gland with the histological picture of hyperplasia makes an extensive search for other hyperplastic glands essential for proper treatment.

LESTER R. DRAGOTZKY, M.D.

Rowntree, L. G., Clark, J. H. and Hanson, A. M.: The Biological Effects of Thyroxine Extract (Hanson). *J. Am. M. Ass.* 934, 1425

Following the continuous administration of thyroxine extract to successive generations of thy mice, the authors observed marked acceleration in the rate of growth and development during the early life of the offspring, particularly of the third and later generations.

An extract derived from the thyroids of young calves seemed to increase the weight and growth of prepubertal and mature male rats and of mated female rats.

When thyroxine extract was administered to newborn, little effect on growth and development was noted although in some instances opening of the eyes occurred earlier.

Thyroxine extract administered intraperitoneally to parent rats seemed to increase the number and size of the litters and the birth weight of the offspring, but the biological effects were most striking in the most evident in the offspring when successive generations of rats were treated by intraperitoneal injection of the extract.

The third generation of test animals are larger at birth and showed striking precocity in growth and development manifested by early eruption of the teeth, appearance of fur, opening of the eyes, descent of the testes, and opening of the vagina. Successive generations of rats born to thyroxine injected parents showed increasing acceleration of growth and development. Thus, in the fifth generation the teeth were erupted and the ears opened on the first day the eyes were opened and the animals covered with fur by the third day the testes descended between the fourth and fifth days, and the vagina opened in twenty days.

In the thyroxine-treated strain of rats the young matured earlier and bred earlier. Offspring of the third generation of test animals cast litters on the fourth and fifth days.

Weight curves showed an increasing acceleration in each succeeding generation. Animals of the fifth generation weighed more than double the normal between the third and twentieth days.

The acceleration of the rate of growth and development of the untreated young born of thyroxine-treated ancestors was apparently not detected through the mother's milk since in two of the experiments it occurred when the young were suckled by control wet nurse mother and it did not occur in control animals suckled by thyroxine-treated mothers.

Interruption of the administration of thyroxine for one generation nullified completely, or to a large extent the effect of the previous administration of thyroxine even when the previous administration had been continued through several generations. The lack of the thyroxine effect became more striking in succeeding litters.

While precocity as lacking in early litters of thyroxine-treated parents, it appeared in later litters

Rats under thymus treatment appeared unusually docile, healthy, and contented. Excessive amounts of thymus extract resulted in an intoxication evidenced by increasing auriculoventricular dissociation and eventual heart block.

HOWARD A. MCKNIGHT, M.D.

Shumacker, H. B., Jr., and Firor, W. M. The Interrelationship of the Adrenal Cortex and the Anterior Lobe of the Hypophysis. *Endocrinology*, 1934, 18: 676.

From experiments on animals, the authors draw the following conclusions:

Severe hypophyseal deficiency causes a striking atrophy of the adrenal cortex. In animals the latter may be corrected by substitution therapy. Hyperpituitarism results in hyperplasia of the adrenal cortex. Hypophysectomy destroys the capacity of the adrenal gland to undergo compensatory hypertrophy when the other adrenal gland is removed. Adrenal insufficiency results in anatomical changes in the hypophysis, the most characteristic of which is a diminution in the number of the normal basophilic cells.

Both hypophyseal and adrenal deprivation cause a stunting of growth, inactivity, and a decrease of the body temperature. In hypophysectomized animals growth cannot be restored, activity increased, or the temperature raised by potent ex-

tracts of hormone of the adrenal cortex. After hypophysectomy, animals may be subjected to unilateral adrenalectomy without affecting their weight, general activity, or health. In adrenalectomized animals weight loss cannot be checked, growth stimulated, the subnormal temperature raised, the general health improved, or survival prolonged by transplants of the hypophysis. The survival period after bilateral adrenalectomy is shortened by a preliminary hypophysectomy.

In both hypophysectomized and adrenalectomized animals there is atrophy of the reproductive system with marked alteration of sex activity. The dysfunction and atrophy of the reproductive organs of hypophysectomized animals is not a secondary manifestation of the lack of hormone of the cortex of the adrenals as the administration of the latter fails to correct the changes in the reproductive tract or to restore sex function. On the other hand, the sex changes in adrenal insufficiency are probably dependent upon degenerative changes in the basophilic cells of the anterior lobe of the hypophysis. The hypophyses of adrenalectomized rats show a decrease in gonad-stimulating power. In mature adrenalectomized female rats, hypophyseal transplants induce oestrus and in immature adrenalectomized female rats they stimulate excessive genital growth and favor prematurity.

JOHN J. MALONEY, M.D.

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### Head

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387

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*Supplementary to*  
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## CONTENTS

I	Index of Abstracts of Current Literature	iii-vi
II	Authors of Articles Abstracted	viii
III	Abstracts of Current Literature	401-479
IV	Bibliography of Current Literature	480-504

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# CONTENTS—MAY, 1935

## ABSTRACTS OF CURRENT LITERATURE

### SURGERY OF THE HEAD AND NECK

#### Head

- HARMER, W. D. The Treatment of Malignant Disease in the Upper Jaw 401
- ARNULF, G. The Pathogenesis of Postoperative Parotitis 461

#### Eye

- FRANCOIS, J. Catarrhal Diphtheritic Conjunctivitis 401
- BIELSCHOWSKI, A. Lectures on Motor Anomalies of the Eyes II. Paralysis of Individual Eye Muscles 402
- CHAVIRA, R. A. The Technique of the Cataract Operation 404
- STALLARD, H. B. Two Cases of Retinal Detachment Presenting Certain Unusual Features After Operation by Surface Diathermy 404
- COWAN, A. Ophthalmic Symptoms in Brain Abscess 411

#### Nose and Sinuses

- LASZLO, A. F. So-Called Mucoid Cysts of the Nose A Report of Three Cases 404

#### Mouth

- PFÄHLER, G. E. The Treatment of Epithelioma of the Cheek 405
- DORRANCE, G. M. The "Push Back Operation" in Cleft Palate Surgery 405
- HOWARTH, W. Pre Cancerous Epitheliomatosis (Bowen's Disease) of the Palate and Fauces 405
- ROSS, J. C. Sarcoma of the Tongue 406
- FRIEDMAN, M., and ROSH, R. Protracted External Irradiation in the Treatment of Neoplasms of the Mouth and Throat A Comparison of the X Rays, the 5 Gm Radium Pack, and the 100-Mgm Radium Pack 467

#### Pharynx

- SHEPLAR, A. E., SPENCE, M. J., and MACNEAL, W. J. Therapeutic Use of the Concentrated Streptococcus Serum of the New York State Department of Health in Patients with Infections of the Ear, Nose, and Throat 406

#### Neck

- OLIVER, R. L. Malignant Epithelial Tumors of the Neck. Carcinoma of Branchiogenic Origin 406
- STARR, P., and PATTON, H. Observations of Remissions in Hyperthyroidism Induced by Pregnancy-Urine Extract 407

- KERNAN, J. D., and SCHUGT, H. P. Abscess of the Larynx and Its Treatment 407
- MARTIN, H. E., and MCNATTIN, R. F. The Treatment of Cancer of the Pharynx, Tonsil, and Extrinsic Larynx by Divided Doses of External Radiation 408
- ROSSI, C. Experimental Studies on Surgery of the Parathyroids 478

### SURGERY OF THE NERVOUS SYSTEM

#### Brain and Its Coverings, Cranial Nerves

- FAY, T. The Treatment of Acute and Chronic Cases of Cerebral Trauma by Methods of Dehydration 411
- PENDERGRASS, E. P., and HODES, P. J. Dilatations of the Cavum Septi Pellucidi and Cavum Vergae 411
- COWAN, A. Ophthalmic Symptoms in Brain Abscess 411
- ADSON, A. W., and CRAIG, W. McK. The Surgical Management of Brain Abscess 412
- BENNETT, A. E., and KEEGAN, J. J. Cerebral Neoplasms The Diagnosis in the Absence of Generalized Intracranial Pressure Phenomena 412
- HARDING, H. E., and NAISH, A. E. Mixed Tumors of the Brain 412
- ROGER, H., and PAILLAS, J. E. Metastatic Tumors of the Brain 413
- VORIS, H. C., ADSON, A. W., and MOERSCH, F. P. Tumors of the Frontal Lobe Clinical Observations in a Series Verified Microscopically 414
- DYKE, C. G., and DAVIDOFF, L. M. The Significance of Abnormally Shaped Subarachnoid Cisterns as Seen in the Encephalogram 414
- GLASER, M. A. Tumors Arising from the Sensory Root of the Trigeminal Nerve in the Posterior Fossa 414
- OSTROWSKI, T., and DOBRZANIECKI, W. Peripheral Facial Paralysis Treated by Cervical Ganglionectomy 414
- PEET, M. M. Glossopharyngeal Neuralgia 414

#### Peripheral Nerves

- SAITO, M. Normal Shadow of the Peripheral Nerves and Their Pathological Change in Injury and Tumor 415

### SURGERY OF THE THORAX

#### Chest Wall and Breast

- PAZZAGLI, R. The Pathogenesis of Cystic Mastitis 416
- BILLI, A. A Contribution to the Knowledge of Perithelioma of the Breast 416
- LOUSTE, A., and CAILLIAU, F. Paget's Disease of the Nipple 416

# INTERNATIONAL ABSTRACT OF SURGERY

iv

FRANKLIN, G. E. and VARTAN, J. H. The Technique and Results of Irradiation in Carcinoma of the Breast

Trachea, Lungs, and Pleura

HEDGECOCK, C. A. and VAN HAREN, W. The Results of Extrapleural Thoracoplasty in the Treatment of Pulmonary Tuberculosis

FRANKS, A. M. and ANDERSON, T. J. Petrol Emulsion, with Special Reference to Anastrolic Striptococci

POPE, H. The Prevention of Pulmonary Complications in Surgery of the Stomach; Pre-Operative Vaccination

SUTCLIFF, W. D. and STEELE, B. T. The Relation of Infection to Postoperative Pulmonary Complications

Heart and Pericardium

BECK, C. S. Contusions of the Heart

HINCK, I. S. Examination of the Heart by the Roentgenkymographic Method

Miscellaneous

GLASSER, H. The Treatment of Intrahepatic Thrombi

TAKINO, M. The Methods of Dissection of Metastases in the Supracardiac Cervical and Axillary Lymph Nodes in Pulmonary Cancer and Their Relation to the Lymph Vessels of the Lungs

## SURGERY OF THE ABDOMEN

Gastro-Intestinal Tract

ALLEN, I. Perforation of Carcinoma of the Stomach into the General Peritoneal Cavity

FRANKEL, J. and FELDMAN, M. The Unstable or Irritable Duodenum: Observations in 100 Cases

KANTON, J. L. Regional (Terminal) Ileitis. Its Roentgen Diagnosis

GALLI, R. and BERGMANN, G. An Experimental Study of Transplantation of the Ileocecal Sphincter in Anastomosis Between the Small Intestine and Colon

TAMM, D. The Value of Negative Exploratory Incisions in Supportive Appendicitis

CORRA, G. Postoperative Appendical Fistula

MITCHELL, G. A. G. The Preservation of the Distal Colon

HUNT, E. Cancer of the Lower Colon (Sigmoid) and Rectum

KUNICH, O. Investigation and Spasmolysis

SPROGEL, R. Investigations on the Action of Anastrolic and Antibiotic Bacteria on the Surviving Small Intestine of the Rabbit

Liver Gall Bladder, Pancreas, and Spleen

LYNDHART, C. BEITLAND, I. and P. TEL, J. Considerations on Solitary Pseudocystic Adenoma of the Liver. Case Report

BARON, B. Studies and Researches on Intramural and Intraluminal Calculi of the Gall Bladder

WASSERMAN, A. E. and MORA, E. G. Cysts in the Region of the Pancreas

CONWAY, N. Determination of Liver Function in the Toxicosis of Pregnancy by the Hemostatic Reaction of Jaundice

## GYNECOLOGY

Uterus

LUCAS, M. The Action of Thyrophysin—Extract of Thyroid and Hypophysis—on the Contraction of the Uterus. Its Use in Obstetrical Therapeutics Experimental and Clinical Study

ANDERSON, G. On Spontaneous Rupture of the Myometrium

HIRSHMAN, W. H. Ten Years of Chiroscopic Diagnosis of Carcinoma of the Uterus

KLATTEN, E. and N. WARTSEL, E. Sarcoma of the Uterus and Vagina

Adnexal and Peritoneal Conditions

WALLANT, J. The Ret and the Secondary Arrangement of the Ovary

MALMO, M. A Contribution to the Study of Ectopic and Intrauterine Hemorrhage of the Ovary and Tube in the Laboring Woman

BRONKHORST, H. The Resistance of the Ovary to Gonadotropic Hormones

External Genitalia

TORPAGER, H. How Should Vulvar Pruritus Be Treated? What Remedy Can be Obtained? Difficult Cases

WALLER, O. A Rare Connective Tissue Tumor in the Region of Bartholin's Glands

SCHRAUTZKE, O. C. DOK, R. CYRUS, S. F. and SCHRAUTZKE, C. Infection of the Intestine of the Vagina (Observations and Results. A Study of 30 Patients)

TEAR, J. The Treatment of Primary Cancer of the Vagina

Miscellaneous

BENNETT, P. M. F. CODE, F. and HANCOCK, A. C. Is Cocaine for the Clinical Use of Progesterone

BARINGER, E. D. The Treatment of Gonorrhea in the Female

ANDERSON, O. The Constitutional Predisposition to Tumors of the Genital Organs in the Female

MARSH, T. The Retraction of the Fornix and the Left Parametrium in Hypophyseal of the Genitalia

## OBSTETRICS

Pregnancy and Its Complications

ROBINSON, L. and D. FLOW, M. M. The Differential Diagnosis of Pregnancy

GREUTERER, N. F. On Luteal Pregnancy

TELLA, P. Antepartum Vaccines in the Treatment of Toxoplasmosis of Pregnancy

CON-SOLI, N. Determination of Liver Function in the Toxæmias of Pregnancy by the Hemoclastic Reaction of Jacchia

HATCH, E. and LEHMANN, K. Investigations into the Occurrence of Eclampsia in Denmark During the Years 1914-27

### Labor and Its Complications

MARŠALL, J., and SMAŽEK, K. Ergotamin in Obstetrics and Gynecology

KOTTMEIER, H. L. The Results Obtained With Thymophysin in Cases of Weak Labor Pains

LEON, J. Delayed Rupture of the Bag of Waters: Certain Reflections Concerning the Hypotheses of Kreis

BURNS, J. W. Breech: A Method of Dealing with the Aftercoming Head

### Miscellaneous

GONFANTINI, M. The Behavior of the Blood Sugar After Injections of Placental Extracts

## GENITO-URINARY SURGERY

### Adrenal, Kidney, and Ureter

TRILLAT, P. Autogenous Vaccines in the Treatment of Pyelonephritis of Pregnancy

GOLDZIEHER, M., and KOSTER, H. Adrenal Cortical Hyperfunction

GESCHICKTER, C. F. Suprarenal Tumors

BACER, J., and LERICHE, R. The Clinical Aspects and Treatment of Paraganglioma: High Pressure Crises of Suprarenal Origin

PRIWES, M. G. The Internal Topography of the Arterial System of the Kidney and Renal Pelvis of Human Beings and Domestic Animals: Roentgen Anatomical Studies

NOSEKAI, A. YON. The Value of Decapsulation in Cases of Medical and Surgical Nephritis

CLUMING, R. E. The Treatment of Bilateral Renal and Ureteral Calculi

WHARTON, L. R. Pre Operative Irradiation of Massive Tumors of the Kidney: A Clinical and Pathological Study

### Bladder, Urethra, and Penis

RIHMER, B. VON. Experiences With Diverticula of the Bladder

MARION, G., and KOGAN, B. Incrusted Cystitis

WATSON, E. M. Complete Rupture of the Urethra: A Method of Repair in Delayed Cases

### Genital Organs

YOUNG, H. H. Prostatic Calculi

GORDON TAYLOR, G. Multiple Fibromata of the Tunica Vaginalis

### Miscellaneous

DECKER, P. Urinary Colibacillosis

## SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

436 Conditions of the Bones, Joints, Muscles, Tendons, Etc

437 YOUNG, A. G., and MACMAHON, H. L. Chronic Proliferative Arthritis in Patients with Rheumatic Fever 448

SWAIN, I. T. Orthopedic and Physical Therapeutic Treatment of Chronic Arthritis 448

437 RABIN, H. Predisposition in Osteochondritis Dissecans of the Capitulum Humeri 449

438 MOLLO, I. Necrosis of the Semilunar Bone of the Wrist 449

438 KOCH, S. I. Disabilities of the Hand 450

438 GULINZ, L. The Diseases of the Intervertebral Joints 450

439 ZADRA, I. Congenital Coxa Vara 451

LOCROSCINO, D. Tuberculosis of the Neck of the Femur 451

LAGREGEN, K. A. The Diagnosis of Meniscus Injuries by Arthrography 452

440 COLONNA, P. C. Congenital Pseudarthrosis of the Leg: Three Cases Treated by Massive Bone Graft 452

### Surgery of the Bones, Joints, Muscles, Tendons, Etc

436 HIAS, S. I. The Treatment of Permanent Paralysis of the Deltoid Muscle 453

441 TODD, A. H. The Treatment of Pes Cavus 454

### Fractures and Dislocations

442 FREIBERG, A. H. Congenital Luxation of the Hip: Selection of Cases for Open Reduction 454

COMPERE, E. L., and PHENISTEP, D. B. The Tibial Peg Shelf in Congenital Dislocation of the Hip 455

## SURGERY OF BLOOD AND LYMPH SYSTEMS

### Blood Vessels

444 PRIWES, M. G. The Internal Topography of the Arterial System of the Kidney and Renal Pelvis of Human Beings and Domestic Animals: Anatomical Roentgen Studies 442

444 SCHUMACHER, S. Arteriovenous Anastomoses 456

444 FRIED, P., and LEVY, A. Information Obtained by Arteriography in Certain Vascular Diseases of the Extremities 457

### Blood, Transfusion

445 GONFANTINI, M. The Behavior of the Blood Sugar After Injections of Placental Extracts 440

445 BOGGS, R. Spontaneous Hemophilia, a Report of Six Cases in Brothers 458

446 RÖ, J. Blood Transfusion 458

446 LENGENHAGER, K. The Question of Pulmonary Embolism 460

DAINELLI, M. Experimental Studies on the Use of Tissue Extracts for Hemostasis 478

JACKSON, H., JR., and PARKER, F., JR. Agranulocytosis: Its Etiology and Treatment 475

# INTERNATIONAL ABSTRACT OF SURGERY

vi

- BUCKLE, G. Colon Bacillus Septicæmia: A Study of Its Pathogenesis and Clinical Aspects 474  
SAURY, L. A Contribution to the Study of Septic Septicæmia of Exclusively Streptococcal or Streptococcal Origin: Symptomatology 475

## SURGICAL TECHNIQUE

- Operative Surgery and Technique: Postoperative Treatment  
PORT, H. The Prevention of Pulmonary Complications in Surgery of the Stomach: Pre-Operative Vaccination 499  
SUTCLIFF, W. D. and SUTCLIFF, B. F. The Relationship of Infection to Postoperative Pulmonary Complications 460  
LEONARDSON, K. The Question of Postoperative Fatshem 450  
ANASTAS, G. The Pathogenesis of Postoperative Paralysis 46  
DANIELLI, M. Experimental Studies on the Use of Thymic Extracts for Hemostasis 478

## Antiseptic Surgery: Treatment of Wounds and Infections

- LOOMIS, W. Treatment with Cod Liver-Oil Ointment, With and Without Plaster Dressing, in Cases of Fresh Wounds, Burns, and Phlegmonous Infections 46  
CLARK, A. M. and CHICKENHEAD, R. The Treatment of Burns 463  
DOUGLAS, J. A Review of the Burn Cases Treated in the Glasgow Royal Infirmary During the Past Hundred Years (1815-1934), with Some Observations on the Present Day Treatment 469  
MILLER, R. H. and ROBERTS, H. The Present Status of Tetanus, with Special regard to Treatment: A Report of Further Cases from the Massachusetts General Hospital 463  
RADA, A. The Role of the Ovarian Constitution in the Evolution and Treatment of Furunculosis 463

## Anesthetics

- HEARD, K. M. Clinical Observations on the Use of E. spin 463

## PHYSICO-CHEMICAL METHODS IN SURGERY

- Röntgenology  
FRANKEL, G. E. The Treatment of Epithelioma of the Cheek 405  
MARTIN, H. E. and MCNITT, R. F. The Treatment of Cancer of the Pharynx, Tonsil, and Esophagus: Larynx by Divided Doors of External Radiation 408  
DYER, C. G. and D. VIVOTTI, L. M. The Significance of Abnormally Shaped Barbiturate Casters as Seen in the Encephalogram 44  
BARRO, M. Morphological Changes in Epithelioma and Their Pathological Change in Epithelioma Tumors 415  
FRANKEL, G. E. and VARTON, J. H. The Technique and Results of Irradiation in Carcinoma of the Breast 47

- KANTOR, J. L. Regional (Terminal) Nerve Its Röntgen Diagnosis 413  
PARKES, M. G. The Internal Topography of the Arterial System of the Kidney and Renal Pelvis of Human Beings and Domestic Animals: Röntgen Anatomical Studies 413

- WRIGHT, L. R. The Operative Irradiation of Malignant Tumors of the Kidney: A Clinical and Pathological Study 444

- LAFFERTY, K. A. The Diagnosis of Metastases by Arthrography 459  
HARRIS, P. and LIVER, A. Information Obtained by Arthrography in Certain Vascular Diseases of the Extremities 457

- HINCH, J. S. Examination of the Heart by the Röntgenographic Method 466

- FRANKEL, M. and ROSS, R. Protracted External Irradiation in the Treatment of Neoplasms of the Mouth and Throat: A Comparison of the X-Ray, the γ-Ray, Radium Pack, and the so-called 467

- CHAVES, L. F. and MACCORMACK, W. B. Hamilton's Method of Continuous Irradiation of the Entire Body for Generalized Neoplasms 468

## Miscellaneous

- HAAS, M. and LOS, A. Short-Wave Diathermy and Its Use in Surgery 469

## MISCELLANEOUS

- Clinical Kithos—General Physiological Conditions  
LEARMONTH, J. R. The Serpents and Pits 471  
KIRCH, O. Irradiation and Spontaneous Hemorrhage in Relation to Shock 473  
FRANKEL, M. D. Catgut Suture 473  
BARCOCK, W. W. The Question of the Feasibility of the Tuberculous Virus in Septic Tuberculosis 473  
FROST, A. G. and PARKER, F. J. Agranulocytosis: Its Etiology and Treatment 473  
WILLIS, R. A. The Structure of Tetanus 474

## General Bacterial, Protozoan, and Parasitic Infections

- BUCKLE, G. Colon Bacillus Septicæmia: A Study of Its Pathogenesis and Clinical Aspects 474  
SAURY, L. A Contribution to the Study of Septic Septicæmia of Exclusively Streptococcal or Streptococcal Origin: Symptomatology 475  
KAWAGUCHI, C. M. Tetanus: A Consideration of 1 Cases, with Observations on the Action of Anaesthetic and Anesthetic Bacteria on the Surviving Small Intestine of the Rabbit 476

## Endocrine Glands

- ROSS, C. Experimental Studies on Surgery of the Parathyroids 478

## Experimental Surgery

- DANIELLI, M. Experimental Studies on the Use of Thymic Extracts for Hemostasis 418

## BIBLIOGRAPHY

<b>Surgery of the Head and Neck</b>		<b>Genito-Urinary Surgery</b>	
Head	480	Adrenal, Kidney, and Ureter	495
Eye	480	Bladder, Urethra, and Penis	495
Ear	481	Genital Organs	496
Nose and Sinuses	481	Miscellaneous	496
Mouth	482		
Pharynx	482		
Neck	482		
<b>Surgery of the Nervous System</b>		<b>Surgery of the Bones, Joints, Muscles, Tendons</b>	
Brain and Its Coverings, Cranial Nerves	483	Conditions of the Bones, Joints, Muscles, Tendons, Etc	497
Spinal Cord and Its Coverings	484	Surgery of the Bones, Joints, Muscles, Tendons, Etc	498
Peripheral Nerves	484	Fractures and Dislocations	499
Sympathetic Nerves	484		
Miscellaneous	484		
<b>Surgery of the Thorax</b>		<b>Surgery of the Blood and Lymph Systems</b>	
Chest Wall and Breast	484	Blood Vessels	500
Trachea, Lungs, and Pleura	485	Blood, Transfusion	500
Heart and Pericardium	485	Lymph Glands and Lymphatic Vessels	500
Esophagus and Mediastinum	485		
Miscellaneous	485		
<b>Surgery of the Abdomen</b>		<b>Surgical Technique</b>	
Abdominal Wall and Peritoneum	486	Operative Surgery and Technique, Postoperative Treatment	500
Gastro Intestinal Tract	486	Antiseptic Surgery, Treatment of Wounds and Infections	501
Liver, Gall Bladder, Pancreas, and Spleen	486	Anesthesia	501
Miscellaneous	486	Surgical Instruments and Apparatus	501
<b>Gynecology</b>		<b>Physicochemical Methods in Surgery</b>	
Uterus	489	Röntgenology	502
Adnexal and Peritubal Conditions	490	Radium	502
External Genitalia	491	Miscellaneous	502
Miscellaneous	491		
<b>Obstetrics</b>		<b>Miscellaneous</b>	
Pregnancy and Its Complications	492	Clinical Entities—General Physiological Conditions	502
Labor and Its Complications	494	General Bacterial, Protozoan, and Parasitic Infections	504
Puerperium and Its Complications	494	Ductless Glands	504
Newborn	494	Surgical Pathology and Diagnosis	504
Miscellaneous	495	Experimental Surgery	504



## AUTHORS OF ARTICLES ABSTRACTED

- Abernethy T J 4 8  
 Abernethy, G 433  
 Adams, A W 41 4 4  
 Ahlborn, G 437  
 Aird, I 4  
 Arnold, G 46  
 Babcock, W W 473  
 Baroni, M 435  
 Berninger, E D 433  
 Besser, J 442  
 Beck, C S 4 8  
 Bendisch, G 422  
 Bennett, A E 4  
 Bertrand, I 424  
 Bickel, G 474  
 Bielchewsky A 40  
 Bill, A 4 6  
 Bishop, P M F 433  
 Boggs, R 453  
 Burns, J W 439  
 Calhoun, F 4 6  
 Charney, R A 404  
 Clark, A M 46  
 Colonne, P C 43  
 Conner, E L 455  
 Connolly, N 436  
 Cook, F 433  
 Costa, G 423  
 Cowan, A 4  
 Craig, W Mich 4  
 Craver, L F 466  
 Crouchback, R 463  
 Crynes, S F 43  
 Crompton, R E 444  
 Danelli, M 473  
 Datsow, M M 433  
 Da xhoff, L M 424  
 Decker P 417  
 Dobrasaevich, W 4 4  
 Dorrance, G M 405  
 Duke, R 43  
 Deaher, J 462  
 Dyke, C G 414  
 F y T 4
- Feldman, M 42  
 Fisher A M 4 8  
 Franco, J 40  
 Freeman, N E 47  
 Freiberg, A H 454  
 Friedewald, J 41  
 Friedman, M 467  
 Frisk, P 457  
 Gally, R 4  
 Geschickter C F 44  
 Gleason H 4 9  
 Glaser M A 474  
 Goldschlager M 44  
 Goldstein, M 440  
 Gordon-T ylor, G 446  
 Gregersen, N F 435  
 Gurets, E 450  
 Haas, M 469  
 Haas, S L 433  
 Hampton, A C 433  
 Harding, H L 4  
 Harner, W D 40  
 Hauck, E 437  
 Heard, K M 463  
 Hedblom, C A 4 8  
 Himmelfarb, H 458  
 Hirsch, I S 466  
 Hodges, P J 4  
 Horvath, W 403  
 Hunt, E 424  
 Jackson, H J 473  
 Kantor J L 41  
 Kavanagh, C N 475  
 Kregas, J 4  
 Korman, J D 407  
 Kurach, O 47  
 Kallen, E 428  
 Koch, S L 450  
 Kogut, B 443  
 Koster H 44  
 Kottmeier H L 453  
 Lagergren, K A 45  
 Lando, A F 404  
 Learmonth, J R 47
- Lehmann, K 437  
 Leongrenberger K 460  
 Leonard, C 424  
 Leon, J 435  
 Lerner, R 44  
 Levy A 437  
 Lob, A 469  
 Looker W 46  
 Logroscino, D 45  
 Lomata, A 416  
 Lohr, M 437  
 MacComb, W S 468  
 MacMahon, H L 445  
 MacNeil, W J 406  
 Mason, J 434  
 Marlow, G 445  
 Markle, J 437  
 Martin, H E 408  
 Martin, M 430  
 McNeal, R F 406  
 McNeil, R H 453  
 Mitchell, G A G 4 3  
 Moench, F P 414  
 Mollo, L 449  
 Murr E G 436  
 Nash, A E 4  
 Navratil, E 463  
 Newkay A von 443  
 Oliver R L 406  
 Ostrowski, T 424  
 Pallas, J E 413  
 Parker, J J 473  
 Patel, J 424  
 Patton, H 407  
 Parnham, R 4 6  
 Peet, M M 414  
 Pendergrew, L P 4  
 Plakier G E 403 4 7  
 Pfenstater D B 453  
 Pohl, H 450  
 Prewer, M G 41  
 Prusse, G 473  
 Rahn, H 449
- Raiga, A 463  
 Rikner B on 444  
 Rd, J 458  
 Robinson, L 435  
 Roger H 4 3  
 Rogers, H 403  
 Roach, R 467  
 Rose, J C 400  
 Ross, C 475  
 Santo, M 4 5  
 Savari, L 475  
 Schaeffer, C 43  
 Schaeffer, G C 43  
 Schacht, H P 407  
 Schmeicher, S 436  
 Shupar A E 406  
 Sigmund, H 430  
 Smolik, K 437  
 Spencer, M J 406  
 Sperry, R 476  
 Stallard, H B 404  
 Starr, T 407  
 Steele, B E 400  
 Steinhil, W D 400  
 Swann, L T 428  
 Takuma, M 410  
 Tama, D 433  
 Todd, A H 454  
 Trapp, J 432  
 Trapp, P 436  
 Turpenti, J 431  
 Van Haer, W 4 8  
 Vassini, J H 417  
 Voria, H C 414  
 Wallert, J 430  
 Wallis, O 43  
 Watson, E M 445  
 Webb-Johnson, A E 436  
 Wharton, L R 444  
 Willis, R A 474  
 Young, A O 438  
 Young, H H 446  
 Zedek, I 45

# INTERNATIONAL ABSTRACT OF SURGERY

MAY, 1935

## ABSTRACTS OF CURRENT LITERATURE SURGERY OF THE HEAD AND NECK

### HEAD

Harmer, W D The Treatment of Malignant  
Disease in the Upper Jaw *Lancet*, 1935, 228 129

Cancer of the upper jaw is easier to cure than cancer in any other part of the upper air passages except the larynx. Its treatment has been greatly improved by the combination of surgery, diathermy, and irradiation.

Both surgery and diathermy are indispensable because, to date, it has been impossible to deliver an adequate dose of irradiation to such deeply situated growths by surface treatment alone. It has been found that complete removal of the upper jaw is inadvisable. The approach should never be made through the skin. As most of the growths are complicated by sepsis, the first essential is the establishment of drainage. Free drainage can be obtained by opening below through the canine fossa or the palate. The soft tissues should be divided with an endotherm knife. The canine fossa should be opened first and if the antrum is found to be full of tumor tissue the hard palate should be removed. As a rule the soft palate should be preserved, even if it is thought to be invaded, because in this situation the disease can be treated successfully by surface irradiation or interstitial needling. If the soft palate can be left intact and ultimately becomes healthy, a very simple denture will repair all of the deformity and render the patient comfortable.

Transpalatal exposure is a simple operation which can be performed rapidly with very little loss of blood and hardly any shock. Intratracheal anesthesia should be employed and the pharynx plugged securely with gauze to prevent blood and pus from passing down into the lungs. After four or five days the outlying malignant cells, which are always present in the bony structure surrounding the cavity and can rarely be destroyed even by heat, should be treated by irradiation. The author prefers radium to the X-rays rays, and surface irradiation to interstitial needling or the use of seeds. The best results

are obtained by slow and prolonged treatments. The permanent opening allows the cavity to be inspected easily so that if at any time a remnant of disease or recurrence is found, it can be treated by diathermy or by further irradiation. There is no external deformity. Complications are rare and serious burns of the skin seldom result. In no case has spreading osteitis occurred. However, small sequestra and some sloughing are common. Occasionally, also, the sight of the eye may be destroyed or a post-irradiation cataract may develop later. As a rule no treatment of the glands of the neck is required.

The described method or some modification of it can be carried out for squamous cell carcinomata, endotheliomata, and low-grade sarcomata such as fibrosarcomata, myxosarcomata, and chondrosarcomata without great risk of causing dissemination. However, when the disease is very advanced and of a highly malignant type, disturbance of the growth should be avoided as much as possible.

The highly cellular carcinomata and sarcomata must always be regarded as inoperable. Deep X-ray treatment or surface irradiation with radium alone or a combination of these procedures is probably the safest method of treatment in most cases. Occasionally, after preliminary irradiation, it may be wise to insert a large number of needles into the jaw through the palate or nose. If the needles are screened with 0.8 mm of platinum they may be left *in situ* for from five to seven days, but the reaction must be watched daily.

JOSEPH K. NARAT, M.D.

Francois, J Catarrhal Diphtheritic Conjunctivitis *Brit J Ophthalm*, 1935, 19 1  
The author's conclusions regarding diphtheritic conjunctivitis are as follows:  
1. Besides the pseudo-membranous forms of diphtheritic conjunctivitis, there is a purely catarrhal form.

- LEWIS L. BROWN

of the Eye II Paralysis 933 1 13  
Muscles. Arch Ophth 933 1 13  
A single muscle in a case of orthoporia  
primary position which

the movement of the parietic muscle  
the action of it is antagonistic  
A moderate innervation is sufficient to bring  
the limits of normal motion, which the check  
elements do not allow to be exceeded. Therefore,  
by means of an excessive innervation, even parietic  
muscle can bring the eye to the normal limit. Hence  
the uniocular field of fixation is of less value for  
the diagnosis of slight parietic than the binocular  
field of fixation or the field of binocular single vision,  
the limits of which are acuity identical. A consid-  
erable limitation of the binocular field of fixation  
results alone, because of Hering's law that the in-  
nervation of both eyes is invariably equal, motor  
impulse must produce a different effect on each eye.  
If one of the muscles executing the lateral move-  
ments is parietic

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[illegible]

dominant close child in the primary deviation  
troublemaker are closer together in primary deviation  
False orientation with the amount of secondary devi  
eye coincides with the amount of the absolute localization  
In the case of correct palsy but the absolute localization  
flares with the paretic eye the changed relations between  
will adapt itself to the changed relations between  
Inversion and its effect and the false orientation then co  
becomes recognized. The paretic localization then co  
is supported by astatic localization in fixing  
rocted is not the paretic eye. The extent of the paretic  
with the nonparetic eye. The degree of palsy  
deviation varies individually with the degree of palsy  
without being proportional to the degree of palsy  
On the other hand, numerous patients with ab  
parets display a marked degree of the disease. These re  
tion from the beginning of the disease partly to the  
most from differences in the extent of muscle tone th  
individual differences in general muscle tone th  
paretic deviation and increased in those cases th  
paretic deviation. This region and the kind of lesion p  
deviation. This region and the kind of lesion p  
during the parastis may also influence the paretic  
characteristic primary and secondary

[illegible]

## PARALYSIS OF THE TROCHLEAR NERVE

By far the most important type of paralysis of a single vertical motor is paralysis of the trochlear nerve. The first striking sign in many cases is habitual torticollis, the ocular origin of which is frequently overlooked. In many cases of the condition in children orthopedic treatment has been given or the sternocleidomastoid muscle has been severed because of an erroneous diagnosis. Paresis of the superior or inferior oblique is probably the cause of the habitual tilting of the head if binocular single vision can be obtained only by this posture. In some cases the head is turned toward the sound side so that the visual line of the paretic eye, being abducted, is not acted on by the oblique muscles. Depression of the head is rare. The theories of the production of these positions of the head are discussed.

A simple apparatus based on the principle of Helmholtz's "Visierzeichen" is used for determining the influence of various positions of the head on the visual images. It consists of a horizontal black strip on white cardboard fixed to a rod 30 in. long which is rotated with the head by means of a metal plate at the other end held between the teeth. A person with left trochlear nerve palsy sees two images of the line, the left image below the right and slanting to converge with the right image at the side of the paretis. Tilting the head toward the paretic side increases the distance and the obliquity, while tilting it toward the sound side causes the images to approach or fuse.

The vertical component is the most important in diagnosis, the deviation increasing when the patient looks down as well as when he looks toward the sound side. The minimum of vertical deviation or even of binocular single vision is found when the patient looks up and to the paretic side. In many textbooks inordinate importance is attached to the lateral deviation component in palsy of the trochlear nerve. However, when a patient with exophoria acquires a trochlear nerve palsy the exophoria transforms the smaller lateral paretic component from an inward to an outward deviation. In at least 25 per cent of typical cases of trochlear nerve palsy, no lateral deviation or even a divergence is found.

In palsy of the trochlear nerve there is a torsion outward (disclination), whereas in palsy of the inferior rectus muscle there is a torsion inward (conclination). When there is homonymous or crossed diplopia, the use of the horizontal test object prevents a mistake in diagnosis for in any case of trochlear nerve palsy the paretic disclination makes the double images converge to the paretic side, whether there is homonymous or crossed diplopia. Besides vertical diplopia. However, as in cases of abducens nerve palsy, trochlear nerve palsy also gradually loses its typical features by the development of a secondary contracture of the antagonist so that the vertical divergence increases in the direction of the sound side and decreases in the opposite direction without a change in the vertical distance of the two

images when the subject looks up or down. Therefore, from the kind of obliquity, it is possible to conclude only that there is a paretic torsion, one cannot decide which eye the paretic muscle belongs to. The diagnosis of the origin of a paresis may be made by the use of the apparatus described for the head tilting test.

The author cites also a peculiar anomaly which is similar to the atypical vertical divergence just described because it produces the impression of excessive functioning of one or both of the inferior oblique muscles. The conditions are apparently the same as in long standing permanent trochlear nerve palsy, in which a contraction of the inferior oblique develops during the improvement of the paretic superior oblique. The anomaly is usually of congenital origin, but in some cases has developed after Kullhan's radical operation on the frontal sinus. In the congenital type there is no disclination of the vertical meridian of the eye such as is found in every case of the acquired disturbance, whether a primary anomaly or a secondary contraction of the inferior oblique following trochlear nerve palsy.

## PARALYSIS OF THE OCULOMOTOR NERVE

Paralysis of individual muscles controlled by the third nerve is rare compared with paralysis of the abducens and trochlear nerves. The diagnosis is based on the principles already discussed. The internal rectus muscle is the only ocular muscle possessing two functions at the command of the will. One of them obeys the impulse to parallel movement of the eyes, whereas the other is governed by the convergence impulse. A loss of both functions without paresis of the third nerve is extremely rare and points to a lesion of the nucleus or the roots of the nerves supplying the internal rectus muscle, neither of which can easily be damaged without involving either ganglion cells or other roots of the third nerve. Loss of convergence alone is frequent. Loss of adduction in looking sideways while convergence is intact is less common. In the majority of cases there is loss of conjugate movement. Loss of adduction only in conjugate parallel movements with normal or nearly normal adduction in convergence can be caused only by a lesion of the posterior longitudinal bundle between the sixth and third nucleus (ophthalmoplegia nuclearis anterior).

Besides the internal recti, there is only one pair of muscles in which unilateral paralysis positively attributable to a supranuclear lesion can develop. One sided elevator paralysis with integrity of the elevator muscles in Bell's phenomenon must be due to a lesion close to the nuclei below the point where the pathway descending from the cortical center for elevation of the eyes bifurcates into the branches which go to the third nuclei. This condition has been observed by the author only three times.

The symptoms of typical oculomotor paralysis are not discussed. Many patients with total paralysis of the third nerve are able to overcome extreme deviations by means of a strong convergence im-

pulse. If the paralyzed eye is constantly fixing be cause of ametropia or amblyopia of the other eye, the secondary deviation may be extreme. Exophthalmos due to relaxation of the rectus muscles in oculomotor palsy may be associated with a striking retraction movement connected with the abduction of the paralyzed eye.

A rare phenomenon called by Koeber "nystagmus retractorius" has been observed only in cases of grave injury of the nuclear region between the third and fourth ventricles. Besides paralysis of a few or many muscles of both eyes, the most striking sign is retraction of one or both eyes following every impulse sent to the eye muscles.

Another peculiar symptom, the pseudo-Gräfe phenomenon, develops in patients partially recovering from oculomotor paralysis. This consists of a retraction of one upper lid and narrowing of the dilated pupil following an impulse to look in a certain direction. The explanation given is that during the healing process following interruption of the third nerve some of the nerve fibers from the central part of the trunk arrive at muscles to which they do not belong. As the nerve fibers apparently prefer certain routes for growing in the wrong sheaths, the impulse to look down and in usually produces the strongest contraction of the upper lid levator.

Cyclic oculomotor nerve paralysis (Azenfeld) is a phenomenon in which there is automatic alternation of spastic and paralytic conditions of the parietic eye. There are rudimentary forms which may be easily overlooked. Some of the latter have been reported as third nerve paralysis showing a peculiar pupal phenomenon. In about 5 per cent of cases the phenomenon is not congenital but acquired in early childhood. In all of the cases reported, only the pupil of the paralyzed eye showed the cyclic type of paralysis. The author believes that the lesion is localized in the region of the third nucleus.

EDWARD S. PLATT, M.D.

Chavira, R. A. *Technique of the Cataract Operation (Técnica de la operación de la catarata)*. *Rev. mexicana de cirugía*, June 7, 1936, 334, 634.

Following a brief review of the evolution of operative procedures for cataract, Chavira discusses the indications for and the usual investigations and treatment preceding the uncomplicated combined extraction of the senile form of cataract and describes the technique of that operation in detail. He emphasizes particularly the importance of subcutaneous anesthesia induced with novocain by Van Lint method and deep anesthesia of the eyeball induced by the retro-ocular injection of novocain.

M. E. MONROE, M.D.

Stallard, H. B. *Two Cases of Retinal Detachment Presenting Certain Unusual Features After Operation by Surface Diathermy*. *Brit. J. Ophth.* 1935, 9, 3.

Stallard reports two cases of retinal detachment treated by surface diathermy with apparent failure

immediately after the operation but with ultimate restoration of the visual fields. Both were emmetropic.

One of the cases, that of a boy thirteen years old who had had poor vision in the eye since an injury four years previously. In this case there was complete detachment of the lower part of the retina involving the macula and associated with large anterior dialysis. Postoperative management was very unsatisfactory because of poor cooperation, and at the end of three weeks there was no reattachment. However six weeks after the operation there was complete reattachment and vision was 6/36.

The other case was that of a woman forty-seven years old who had had detachment for ten months. In this case surface diathermy was performed with a single trephine opening and the release of subretinal fluid, and the diathermy applications were repeated after fourteen days. The detachment still persisted several weeks later but improvement occurred gradually. Three months later there was no sign of detachment and vision was 6/34.

The author believes that in both cases the retinal tears were occluded that the subretinal fluid, originating either as aqueous or as a transudate following the inflammatory reaction, was at first able to pass through, but as the healing process became more firm the fluid present was absorbed and no more could pass through, the detachment then becoming cured.

WILLIAM A. M. JR., M.D.

## NOSE AND SINUSES

Laszlo, A. F. *So-Called Mucoid Cysts of the Nose: A Report of Three Cases*. *Arch. Otolaryngol.* 1935, 4.

Laszlo states that in all cases of mucoid cyst of the nose reported previously the site of the cyst was the same as in his cases and, except when the cyst became infected and broke down, the contents of the cyst were also clinically the same.

As rule microscopic examination showed columnar ciliated epithelium, but in some cases the multi-layered pavement epithelium formed the covering and in others transformation of the pavement epithelium to columnar or ciliated columnar epithelium was observed.

In some cases cholesterol, as found in the cyst, but the majority it was absent. Absence of cholesterol in the contents of the cyst cannot serve as a basis for differential diagnosis as there are many dentigerous cysts which do not contain cholesterol.

Laszlo agrees with Rohmer that the cysts are of embryological origin and develop either from the epithelial sheet of Hertwig or from misplaced enamel anlagen mixed with misplaced anlagen of the inner epithelium. In the cranio-ethmoidal fissure, chiefly where the lateral process of the superior maxilla meets the nasal process. He believes they should be

classified as cysts of dental origin Whether or not trauma or any other external factor such as infection or inflammation is the cause of their development has not yet been determined

JAMES C BRASWELL, M D

## MOUTH

**Pfahler, G E** The Treatment of Epithelioma of the Cheek *Radiology*, 1935, 24 99

The author briefly reviews the oral conditions associated with cancer of the cheek and discusses the problems of prophylaxis and the problem of bringing the patient to the doctor while the lesion is still in the early stages In reporting in detail six of his cases in which a successful result was obtained, he emphasizes that each case must be treated according to its individual requirements In the six cases he reports heavy irradiation was given Deep X-ray therapy, the surface application of radium, and interstitial irradiation were all employed Surgery was used as an adjunct usually when deep bone involvement was present in the mandible

**Dorrance, G M** The "Push-Back Operation" in Cleft-Palate Surgery *Ann Surg*, 1935, 101 445

The attainment of good speech in cases of cleft palate requires complete velopharyngeal closure Such closure is obtained only by an operation permitting the velum to come into contact with the pharyngeal wall so that the "palatopharyngeal sphincter" shuts off the more satisfactory the speech efficient the closure the more satisfactory the speech A considerable number of persons with cleft palate have a short palate, especially individuals with a cleft velum alone or in whom the cleft extends as far forward as the junction of the middle and anterior thirds of the hard palate When no shortening of the velum exists, good operative and functional results may be obtained by successful closure of the cleft palate without use of the push back operation

The palatopharyngeal sphincter is a muscular ring formed by the pterygopharyngeal portion of the superior constrictor muscle which inserts in the palatal aponeurosis at the site of insertion of the palatopharyngeal muscle When it contracts it shuts off the anterior segment of the muscle forming the pharyngeal ring is split and the separated ends are far apart The tensor palati muscle is shorter than normal, and its contracture increases the diameter of the nasopharynx This lateral process which permits the anterior ends of the cleft pharyngeal ring to be approximated at the midline and thus restores the divided "palatopharyngeal sphincter"

All conservative surgical methods for repair of the palate are based on the principle of medial displacement of the palatal soft parts as described by von Langenhack, but this fails to restore function in cases of short palate Dorrance prefers a two-stage

procedure with an interval of at least three months between the stages In the first stage he raises a mucoperiosteal flap as far back as the attachment of the palatal aponeurosis and then replaces it In the second stage he raises the palatal flap again, frees the palatal aponeurosis and nasal mucous membrane from the posterior border of the hard palate, and divides the hamular processes to release the tension so that the two halves of the cleft palate will meet in the midline He recommends use of the aluminum-bronze tension suture suggested by Veau The anterior edge of the displaced flap is fastened with a silver wire passed around the molars

In conclusion Dorrance again emphasizes that the "push-back" operation is not employed in all cases and advises against its use before the age of five years

THOMAS W STEVENSON, JR, M D

**Howarth, W** Pre-Cancerous Epitheliomatosis (Bowen's Disease) of the Palate and Fauces *J Laryngol & Otol*, 1935, 50 28

In 1912 Bowen reported two cases of dermatosis with chronic atypical epithelial proliferation The disease was a chronic condition characterized by single or multiple papulosquamous, eroded, or crusty hyperkeratotic tumor masses The lesions occasionally metastasized to distant organs, but as a rule were benign. Subsequently several cases in which the lesions occurred on the vulva were reported

The described histological changes were (1) dyskeratosis in a hyperkeratotic epithelium, (2) intracellular edema resulting in a vacuole about the cell nucleus, (3) numerous mitoses, (4) clumping of large cells with giant nuclei and large nucleoli, (5) hyperkeratosis and parakeratosis, and (6) a general confused picture of the malpighian layer

The author reports three cases in which the lesions were similar in their clinical manifestations and histological appearance to the lesions previously described, but were located on the mucous membrane of the mouth His article contains sketches of the gross lesions and photomicrographs

In the first case, that of a man fifty-six years old, there was involvement of the cheek, soft palate, lips, and floor of the mouth Since 1920 the growth has been partially controlled by diathermic cauterization No evidence of malignancy has developed

In the second case, that of a man fifty-five years old, the lesion responded well to cauterization, but the treatment was given too recently for judgment of the permanency of the cure

In the third case, that of a man fifty-eight years old, the same treatment given recently has resulted in improvement

All of the histological sections were similar The epithelium was greatly thickened, there being elongation and broadening of the interpapillary processes On the surface there was a layer of necrosed keratinized epithelium infiltrated with inflammatory

cells. Small groups of large stratum granulosum cells were present. In the cells of the stratum malpighii were eosinophilus hyaline bodies. Frequently one of these bodies filled a cell. The cells of the basal layers of the epithelium sometimes faded off into subepithelial connective tissue. This early invading carcinoma. The subepithelial connective tissue was fibrotic and infiltrated with plasma cells and lymphocytes.

The author suggests that the presence of inclusion bodies may indicate that the etiological factor is a filterable virus.

LOUIS T. BYARS, M.D.

Ross, J. C.: Sarcoma of the Tongue. *Brit. M. J.* 1935, 54.

The author briefly reviews the literature on sarcoma of the tongue, pointing out that no one man has ever seen a sufficient number of cases to write a report on the condition which is of much value.

The literature indicates that sarcoma of the tongue is disease of adult life and occurs more frequently in males than in females.

The true sarcomata of the tongue are (1) small round-cell sarcomata, (2) large round-cell sarcomata, (3) spindle cell sarcomata, (4) mixed-cell sarcomata and (5) lymphosarcomata.

The early symptoms are due merely to swelling of the tongue. The later symptoms are those of advanced carcinoma of the mouth.

The most frequent locations of sarcoma are the middle and posterior thirds of the tongue. The swelling is firm and elastic. Ulceration occurs only where a large tumor is in contact with sharp teeth. Metastasis to the cervical nodes occurs in 40 per cent of the cases.

The lesion differs from carcinoma in that it appears earlier in life, it is rarely associated with pain, it is firm and elastic whereas carcinoma is hard, craggy and friable, it arises as an intraglossal mass, and carcinoma is usually ulcerated early.

The author's treatment is surgical removal of all or half the tongue followed by block dissection of the cervical glands.

Ross concludes that the prognosis is not so unfavorable as might be anticipated.

LOUIS T. BYARS, M.D.

## PHARYNX

Shepler, A. E., Spencer, M. J. and MacNeal, W. J.: Therapeutic Use of the Concentrated Streptococcus Serum of the New York State Department of Health in Patients with Infections of the Ear, Nose, and Throat. *Arch. Surg.* 1935, 99.

The authors state that eight patients suffering from severe infection with hemolytic streptococci in the field of otorhinolaryngology—six of them with positive blood cultures—were treated with the concentrated streptococcus serum of the New York State Department of Health, with a death and six recoveries.

The early use of this serum is indicated in streptococcal infections of the upper respiratory tract and the middle ear to forestall the all too-common serious sequelae of these maladies.

Postoperative infections in the upper respiratory tract may also be favorably influenced by the serum.

JAMES C. BRADWELL, M.D.

## NECK

Oliver, R. L.: Malignant Epithelial Tumors of the Neck. Carcinoma of Branchiogenic Origin. *Am. J. Cancer* 1935, 3, 6.

Since the gill system is a forerunner of the development of the thymus and thyroid and is responsible for vestigial elements through defective closure or incomplete obliteration of the pre-cervical slanes, it seems wise to designate deep infiltrating epithelial tumors of the neck as being of branchiogenic origin. The persistence of any portion of the external or internal clefts of the branchial apparatus which normally disappears will give rise to epithelial remnants which may develop as cysts or deep malignant epidermoid tumors of the neck.

The author presents a study of eighty carcinomas arising in the deep tissues of the neck without relation to the epidermis or glandular organs.

These tumors occurred nine times more frequently in males than in females and were most common at the sixth decade of life. The average duration of the symptoms as between six and seven months. The usual sign of onset was the appearance of a tumor in the neck without relationship to clinical findings in the throat or to other organs in the cervical region. Among other clinical manifestations were stiffness of the neck, headache, hoarseness, pain, and general cervical node enlargement. In about 10 per cent of the cases the onset of the clinical history followed trauma. The position of the tumor was usually in the upper anterior cervical triangle, behind and below the angle of the jaw.

Radical surgery is required for these rapidly growing and infiltrating tumors. The usual operation advocated involves block dissection of the glands of the neck with resection of the larger vessels of the neck, including, in some instances, the internal and common carotid artery.

Pathologically the tumors in the reported cases are grossly either solid or cystic. Under the microscope they could be divided into squamous-cell, cuboidal cell, and basal cell forms. The cuboidal cell and basal-cell forms were subdivided into two groups diffuse and alveolar.

In the differential diagnosis it was necessary to rule out cervical lymphadenitis, benign branchial cleft cysts, malignant lymphomas and metastases from carcinoma of the nasal sinuses or structures of the throat.

These tumors constitute a single pathological entity grading from the less differentiated basal-cell form through the cuboidal-cell form to the most highly differentiated squamous-cell form. Surgery

is slightly more favorable in the last two forms than in the first form. Irradiation is probably advisable in conjunction with surgery in all forms, but particularly in the basal cell form. In advanced and inoperable cases palliative irradiation may be helpful.

JOSEPH K. NARAT, M.D.

Starr, P., and Patton, H. Observations of Remissions in Hyperthyroidism Induced by Pregnancy-Urine Extract. *Ann Int Med*, 1935, 8 825

Thirteen cases of hyperthyroidism have been treated with extract of pregnancy urine and theelin. The usual course of the treatment lasted for from four to five months, the shortest was two weeks and the longest seven months. Remission of the hyperthyroidism occurred in seven of the cases. The six cases in which the treatment failed were those of a boy, a woman two years past the menopause, a woman with hypertension and nodular goiter of twenty-three years' duration, who was at the menopause, a woman in whom a remission had been induced but an infection of the upper respiratory tract developed, a woman of thirty-four years who had had two pelvic operations for infection and adhesions, in one of which the right ovary was removed, and a Negro woman with excessive, atypical myasthenic hyperthyroidism. As the women in whom the treatment was successful were definitely below the menopause and had no history of ovarian disease, it appears that the induction of a remission by extract of pregnancy urine is dependent on normal ovarian function.

At the present time it is impossible to present physiological proof that the remission in these cases may be attributed to the extract of pregnancy urine and theelin as the mechanism of such an action is unknown. Nevertheless, remissions occurred—abruptly in the healthiest adolescent girl and more gradually in the women. In two cases the return of menstruation, which had ceased during the treatment with extract of pregnancy urine, was coincident with remission as evidenced by a gain in the weight, which previously had been stationary, and reduction of the metabolic rate to, or nearly to, normal.

Kernan, J. D., and Schugt, H. P. Abscess of the Larynx and Its Treatment. *Ann Otol, Rhinol & Laryngol*, 1934, 43 1009

Abscess of the larynx has been called "oedema laryngis," "oedema glottidis," "laryngitis submucosa," "laryngitis oedematosa," "laryngitis phlegmonosa," "angina laryngea infiltrata," "laryngitis seropurulenta," "angina laryngea oedematosa," and "abscessus laryngis." All of these terms refer to a condition which develops from a so-called laryngitis submucosa and may progress to any of the following stages of development: (1) oedema of the larynx, (2) perichondritis of the larynx, (3) abscess of the larynx, and (4) phlegmon of the larynx.

The traumatic form of laryngeal abscess is the only one that has its origin in the larynx itself. All

other abscesses of the larynx must be considered secondary to infections of a general nature or occurring in the vicinity of the larynx. Formerly, typhoid fever was the most common infection. More recently the majority of the abscesses reported have followed grippe or have occurred in association with an acute tonsillitis and pharyngitis. Infections localized primarily in the throat may reach the larynx by superficial spread or involve it by way of the blood stream.

The symptoms of laryngeal abscess are pain, which may be spontaneous or noted only on pressure or swallowing, hoarseness, which may vary considerably in intensity, and dyspnoea due to oedema about the site of infection.

In the adult, there may be osteomyelitis of the ossified cartilages when the disease has persisted for some time. This may be associated with chronic swelling, a discharging sinus, and sequestra formation.

In infections of the thyroid cartilage the outer wall and the floor of the pyriform fossa bulge upward. This bulging has been regarded as pathognomonic of an exudative process in the thyroid cartilage. If only the floor of the pyriform fossa bulges upward the disease process may be in the vicinity of the thyroid cartilage as well as near the cricoid cartilage.

Marked swelling of the ventricular bands indicates involvement of the thyroid cartilage, whereas swelling of the posterior wall of the larynx beneath the laryngeal aperture is more indicative of involvement of the cricoid cartilage.

The cricoid cartilage is least often affected in abscess formation and perichondritis, but the cases with involvement of this cartilage have the most serious complications and are the most difficult to treat. In the characteristic picture of cricoid cartilage involvement there is a marked swelling of the lamina cricoidea, particularly of its pharyngeal surface, which bulges in a tumor-like swelling, pushing the entire larynx forward and thereby blocking the pharynx. Difficulty in swallowing is more marked than in any other form of inflammatory disease of the laryngeal cartilages. In addition, swelling and fixation of the arytenoids usually occur if the infection involves the entire lamina cricoidea. If the infection is limited to one side of the lamina cricoidea, the opposite arytenoid is more or less freely movable. This is the case fairly often because the lamina consists of two lateral bony nuclei separated by a cartilaginous central portion.

With regard to the treatment of perichondritis or abscess of the larynx there is considerable difference of opinion. Some laryngologists advocate conservative treatment while others advocate the most radical surgical procedures. Since in most of the cases seen formerly the condition was a complication of typhoid, and since in this infection several of the laryngeal cartilages were usually affected at the same time, it is understandable that a radical procedure was advocated because of the frequency



viscosity of the saliva. The patient complains of dryness of the mouth and difficulty in swallowing or expectorating the secretions. At the beginning of treatment the authors order irrigation of the mouth every two hours with solution of sodium bicarbonate in warm water. This is done with a 2-qt. irrigating can, rubber tube, and glass nozzle. Dysphagia is present in some degree in all cases in which a mucositis is produced in any portion of the pharynx between the soft palate and the pyriform sinuses. In most cases soft or liquid food can be taken in sufficient quantity to maintain the patient's weight at the time of his admission to the hospital. In some cases, especially those of involvement of the hypopharynx, the dysphagia may be more marked because of the combination of pain and swelling of the arytenoids at the height of the reaction.

Prophylactic tracheotomy should be considered in all cases of growths involving the arytenoids, ventricular folds, or vocal cords. If tracheotomy becomes necessary it should be done before beginning treatment in order to avoid the necessity of opening up tissues in which there is marked radia-

tion reaction and of interrupting the sequence of treatments. While the skin is in a dry state, the authors use frequent applications of mineral oil without any other dressing. When the surface becomes moist they apply single layers of gauze bandage impregnated with boric acid ointment, and continue this dressing until healing has taken place and the skin is again dry and whole.

Of 140 patients treated during a period of 15 years, 4 (2.9 per cent) remained free from disease for a period of from one and three quarters to two and one half years. Twelve of the latter have been free from disease for from two to 10 and one half years and the rest for from nine months to two years. The relatively better prognosis in the cases of females has already been emphasized by Costard. The average age of the patients was about the same in the cases with successful results and those with unsuccessful results. Practically all of the patients with unsuccessful results died of persistent cancer either local or metastatic. Death from visceral metastases occurred in several cases in which successful local result was obtained.

JOSEPH E. MABAY, M.D.

# SURGERY OF THE NERVOUS SYSTEM

## BRAIN AND ITS COVERINGS, CRANIAL NERVES

Fay, T. The Treatment of Acute and Chronic Cases of Cerebral Trauma by Methods of Dehydration *Ann Surg*, 1935, 101 76

Fay states that statistics show a definite reduction of the mortality (11.4 per cent) in cases of acute cerebral trauma treated by dehydration therapy. In his treatment of such cases the usual conservative treatment, including the administration of 50 c cm of a 50 per cent solution of glucose, is given during the period of shock, and from 100 to 300 c cm of saline solution may be given to combat severe blood-volume loss of fluid. After the period of shock a lumbar puncture is done, roentgenograms are made, and the wounds are sutured. Hypertonic solutions are given by mouth, rectum, or vein, depending upon the general state of dehydration. If the spinal fluid is clear, 20 oz of liquid and a "dry" or solid diet are allowed. If the spinal fluid is blood, 30 oz of liquid are allowed and this amount is maintained until daily spinal drainage is discontinued upon the recovery of xanthochromic fluid. The patient usually leaves the hospital after from ten to twelve days and on discharge is given specific instructions as to diet and the maintenance of dehydration. The daily weight is used as a guide to water storage as 1 pt weighs approximately 1 lb.

The author has found that when a solid dry diet and a total of 20 oz of fluid per day are given, consciousness returns, the patient is free from headache, and little or no spinal fluid need be removed by lumbar puncture after the second day. After their discharge from the hospital, his patients usually receive 32 oz of fluid daily for the next three months. Follow up findings in the cases of patients maintained on a fluid balance after discharge from the hospital have shown 92 per cent to be free from the usual post traumatic syndromes.

ROBERT ZOLLINGER, M D

Pendergrass, E P, and Hodes, P J. Dilatations of the Cavum Septi Pellucidi and Cavum Vergæ *Ann Surg*, 1935, 101 269

Three cases of dilatation of the cavum septi pellucidi are reported. All of the patients showed a quantitative intellectual reduction with inability to concentrate. Two showed a tendency to be euphoric and jocose. All suffered periods of unconsciousness at irregular intervals, and two had clonic convulsions. Among other signs were speech defects, incomplete motor weakness of the extremities, severe headache, loss of deep sensation, and ataxia. In one case there was a loss of part of the visual fields. The picture differed from that of

lesions of the corpus callosum in that somnolence and motor apraxia were absent.

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The cavum vergæ presents the same appearance in the anteroposterior and posteroanterior views, but when viewed laterally the dilatation suggests an hourglass. The cavum septi pellucidi, becoming narrower posteriorly, widens into an oval cavity which is interpreted as a dilated cavum vergæ.

JOHN WILTSIE EPTON, M D

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Choking of the disks averaging 3.9 diopters occurred in 55.5 per cent of nine patients with abscess of the temporal lobe. In three cases the choking was always greater, and in two it was eventually greater, in the homolateral eye. Homonymous hemianopic fields corresponding to interference along the optic tracts on the side of the lesion were found in three cases. Homonymous hemianopsia on the opposite side was found in one case and a corresponding inferior homonymous quadrantanopia in another. In two cases the pupils were unequal and showed a sluggish response to light. In both, the smaller pupil was on the side of the lesion.

In 42.8 per cent of the seven cases of abscess of the parietal lobe there was an average choking of



3 Radium element pack with filtration by 20 mm Pb (equivalent), a distance of from 10 to 15 cm, and an applicator portal 10 cm in diameter

The radium-element pack contains 4 gm of radium. As yet, it is impossible to express its output in roentgens as the measurement of gamma rays in roentgens has not been settled to the satisfaction of all radiologists

The authors state that in 1931 they began using open portals from 80 to 150 sq cm in area. The skin portal must obviously include the primary lesion and all cervical metastases within the range of the primary beam. One of the advantages of a large skin portal is the assurance that all foci of the disease are included. However, there is a definite relationship between the size of the portal and the general tolerance with equal doses expressed in roentgens. This being true, it seems illogical to use portals from 10 to 12 cm in diameter in treating a localized lesion alone or with a superimposed metastasis 2 or 3 cm in diameter. While larger portals undoubtedly deliver a greater tissue dose at a depth, the limits of tolerance are approached too closely in the use of such portals. The authors therefore employ smaller portals more carefully centered over the lesion itself.

If the beam of irradiation is limited by a metal cone attached directly to the tube holder, it may be accurately centered and directed over the desired tissue volume. Such a cone is of practical value for several reasons. As it is placed in contact with the skin, exact localization of the skin portal is more readily accomplished from day to day, especially if the skin is marked with a dye such as gentian violet. The patient is much less apt to move as the cone placed against the skin surface area of a circular portal is greater than a square portal. The authors recommend that circular rather than square or oblong skin portals be employed whenever possible.

In most of their pharyngeal and laryngeal cases they have used only 2 portals—1 on each side of the neck. In some cases of palatal, tonsillar, or upper pharyngeal wall carcinoma they have found it of advantage to irradiate through the open mouth with the use of a mouth cone. In lesions of the posterior nasopharynx they employ 4 portals if there are metastases to the neck. In irradiating cancer of the anterior floor of the mouth, 3 portals may be used—1 on each cheek and 1 in the submental region, the irradiation being directed so as to crossfire the primary lesion. The maxillary antrum is usually irradiated through 1 portal although in some cases it is of advantage to use 2 contiguous square or oblong portals on the same cheek. The treatment period and the total dose are increased if this is indicated by the clinical course and local and general tolerance. Using portals from 7 to 10 cm in diameter (from 40 to 80 sq cm) the authors begin with a treatment of from 350 to 400 r (measured in air) daily to alternate sides of the neck so that at the end of 20 treatments the patient has received from 3,500 to 4,000 r to each side. In the use of the

700-kv machine with a filter of 5 mm Cu (equivalent), from 400 to 450 r are given daily, a total of from 4,000 to 4,500 r being administered. With the element pack, the authors give about 10,000 mgm-hr daily (cone 10 cm in diameter) for a total of 100,000 mgm-hr in three weeks. They see no advantage in interrupting the treatment to allow the patient several days of rest before completing the original plan, as is recommended for some cases by Courtard.

With the doses mentioned there begins, in from six to ten days, a mucositis of the pharynx, most commonly first in the soft palate, the arytenoids, or the aryepiglottic folds. This increases steadily throughout the treatment and usually goes on to the development of a false membrane of diphtheritic appearance which may cover the mucosa of the entire pharynx. The lesion reaches its maximum from twenty to thirty days after the beginning of treatment and usually disappears in about ten days. It is followed by a decrease in the congestion and oedema. The oedema may persist for several weeks or months, depending largely on the total dose given. In cases of lympho-epithelioma or transitional-cell carcinoma regression of the tumor may begin as early as the fourth or fifth day, but is usually not apparent until after the first week. The skin reaction appears later than the mucosal reaction. A definite erythema of the skin is usually apparent after from seven to ten days, but as a rule the skin reaction does not reach its maximum until about twenty days after the beginning of treatment. In most cases it consists of destruction of the entire epidermis leaving a raw weeping surface which bleeds on slight trauma.

With the use of large fields and heavy doses, the limit of the patient's general tolerance is reached before the limit of the local tolerance and there is produced a chronic irradiation sickness which is not due to dyspnoea, lack of nutrition, or changes in the skin or mucous membrane. The patient becomes listless, weak, and toxic, loses weight, and develops cachexia. This condition is probably due to the volume of tissue irradiated rather than the local intensity of the effect or may be the result of partial derangement of the function of the various glandular, vascular, and nervous structures of the neck. It can be prevented by avoiding the use of large skin portals except when they are required by wide distribution of the disease. The authors have found no changes in the blood picture that could be attributed directly to the irradiation.

Loss of weight during and following treatment is due to lack of sufficient alimentation. Even at the height of the reaction, most patients do not complain of local pain while the tongue and pharynx are at rest. Any motion of the tongue and pharynx, as in the act of swallowing, is quite painful, but the local symptoms seldom require the use of narcotics, even for sleep. Beginning about four or five days after the first treatment, there is a progressive diminution in the quantity and an increase in the

viscosity of the saliva. The patient complains of dryness of the mouth and difficulty in swallowing or expectorating the secretions. At the beginning of treatment the authors order irrigation of the mouth every two hours with a solution of sodium bicarbonate in warm water. This is done with a 2-qt. irrigating can, rubber tube, and glass nozzle. Dysphagia is present in some degree in all cases in which a mucositis is produced in any portion of the pharynx between the soft palate and the pyriform sinuses. In most cases, soft or liquid food can be taken in sufficient quantity to maintain the patient's weight at the time of his admission to the hospital. In some cases, especially those of involvement of the hypopharynx, the dysphagia may be more marked because of the combination of pain and swelling of the arytenoids at the height of the reaction.

Prophylactic tracheotomy should be considered in all cases of growths involving the arytenoids, ventricular folds, or vocal cords. If tracheotomy becomes necessary it should be done before beginning treatment in order to avoid the necessity of opening up throats in which there is marked radia-

tion reaction and of interrupting the sequence of treatment. While the skin is in dry state, the authors use frequent applications of mineral oil without any other dressing. Where the surface becomes moist they apply single layers of gauze bandage impregnated with boric acid solution, and continue this dressing until healing has taken place and the skin is again dry and whole.

Of 140 patients treated during a period of two years, 41 (29 per cent) remained free from disease for a period of from one and three-quarters to two and one-half years. Twelve of the latter have been free from disease for from two to two and one-half years and the rest for from nine months to two years. The relatively better prognosis in the cases of females has already been emphasized by Costard. The average age of the patients was about the same in the cases with successful results and those with unsuccessful results. Practically all of the patients with unsuccessful results died of persistent cancer either local or metastatic. Death from visceral metastases occurred in several cases in which a successful local result was obtained.

JOSEPH K. WARAT, M.D.

# SURGERY OF THE NERVOUS SYSTEM

## BRAIN AND ITS COVERINGS, CRANIAL NERVES

Fay, T. The Treatment of Acute and Chronic Cases of Cerebral Trauma by Methods of Dehydration *Ann Surg*, 1935, 101 76

Fay states that statistics show a definite reduction of the mortality (11.4 per cent) in cases of acute cerebral trauma treated by dehydration therapy. In his treatment of such cases the usual conservative treatment, including the administration of 50 c.cm. of a 50 per cent solution of glucose, is given during the period of shock, and from 100 to 300 c.cm. of saline solution may be given to combat severe blood-volume loss of fluid. After the period of shock a lumbar puncture is done, roentgenograms are made, and the wounds are sutured. Hypertonic solutions are given by mouth, rectum, or vein, depending upon the general state of dehydration. If the spinal fluid is clear, 20 oz. of liquid and a "dry" or solid diet are allowed. If the spinal fluid is blood, 30 oz. of liquid are allowed and this amount is maintained until daily spinal drainage is discontinued upon the recovery of xanthochromic fluid. The patient usually leaves the hospital after from ten to twelve days and on discharge is given specific instructions as to diet and the maintenance of dehydration. The daily weight is used as a guide to water storage as 1 pi weighs approximately 1 lb.

The author has found that when a solid dry diet and a total of 20 oz. of fluid per day are given, consciousness returns, the patient is free from headache, and little or no spinal fluid need be removed by lumbar puncture after the second day. After their discharge from the hospital, his patients usually receive 32 oz. of fluid daily for the next three months. Follow-up findings in the cases of patients maintained on a fluid balance after discharge from the hospital have shown 92 per cent to be free from the usual post traumatic syndromes.

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In 42.8 per cent of the seven cases of abscess of the parietal lobe there was an average choking of

5.3 diopters. The only external ocular sign was paralysis of both external recti muscles in one case. In three of the seven cases there were no ocular signs or symptoms.

Of the four cases of abscess of the occipital lobe, the optic disks were affected in all. In the three cases in which it was measurable, the choking varied 5.8 diopters. A patient with basilar meningitis presented bilateral ptosis.

In 41.8 per cent of the seven cases of abscess of the cerebellum the optic disks showed an average elevation of 5.5 diopters. In six cases variety of nystagmoid movements occurred, and in one case there was paresis of conjugate upward rotation. Ophthalmic signs or symptoms were present in all but one case.

Of the entire series of cases, choking of the disks was found in 63.6 per cent. The fact that fourteen of the twenty-eight patients with affected nerve heads had an uncomplicated papilloedema suggests that, in abscess of the brain, choked disk is due to increased intracranial pressure instead of the absorption of toxic material. However, in thirteen patients the degree of choking remained the same or was increased after operation.

One or more ocular signs or symptoms were found in all except six of the forty-four cases of abscess of the brain. ROBERT ZOLLINGER, M.D.

Adson, A. W. and Craig, W. McK. The Surgical Management of Brain Abscess. *A. N. Surg.* 1936, 7.

Adson and Craig report a clinical and postmortem review of ninety-seven cases of cerebral abscess which were treated by five surgeons in the Neurosurgical Department of the M. D. C. Forty of the abscesses were situated in the frontal lobe, thirty-six in the temporoparietal, ten in the occipital, and thirteen in the cerebellar. The remaining six had miscellaneous distribution.

Because of the greater frequency of abscesses in the temporoparietal lobes than in the cerebellum, Adson and Craig have made it rule to explore the temporoparietal lobe before exploring the cerebellum on the side of the infected ear when cerebral abscesses follow infections about the ear with indolent localizing symptoms or conflicting signs of localization.

In re-reading the protocols of MacCraw's cases of cerebral abscess, they were impressed by the fact that in most of the cases there was a history of cerebral infection of fortnight or more. They believe that MacCraw's excellent results are due chiefly to the fact that sufficient time elapsed for immunity and encapsulation to become established before operation was undertaken.

They state that while the surgical drainage of a brain abscess removes active organisms, it is probably more beneficial in disposing of the intracerebral mass. The arguments for delaying the drainage of cerebral abscess until it is mature—that is, until the occurrence of encapsulation—such suggests the es-

tablishment of immunity—are comparable to those for the delay of drainage of other inflammatory lesions of the body. Drainage of the abscess is rarely advised for acute peritonitis, whereas it is urged after an abscess has been formed.

The authors advocate supportive treatment during the initial stage of infection and delay of drainage until the clinical signs indicate the establishment of immunity. They prefer adequate continuous drainage through a surgically sealed cerebral wound to the various conservative and ultraradical measures that are employed.

Bennett, A. R., and Kaegan, J. J.: Cerebral Neoplasms. The Diagnosis in the Absence of Generalized Intracranial Pressure Phenomena. *J. Am. M. Ass.* 1935, 94, 2.

The authors present twelve cases of cranial neoplasms in which the characteristic triad of symptoms of generalized increased intracranial pressure was absent. None of these cases presented changes in the fundi, and in only two of them was the spinal fluid pressure above 100 mm Hg.

A review of the literature shows that headache, the most prominent symptom of brain tumor, is absent in at least 10 per cent of cases. Papilloedema is absent in from 5 to 30 per cent, and vomiting is even less frequent. Headache, vomiting, and papilloedema are present together in only about 60 per cent of the cases. Local pressure signs caused by intracerebral calcification, rarefaction of bone, increased diploic vessel markings, and shifting of the pineal shadow are very important in the early diagnosis of brain tumor before the onset of increased intracranial pressure. Among the common early signs of brain tumor are epileptiform attacks—grand mal, petit mal, or Jacksonian seizures. Frontal lobe neoplasms are often manifested first by psychic disturbances.

In the authors' twelve cases the most valuable single early diagnostic sign was focal spasm. Jacksonian seizures occurred in eight cases. The earliest symptom in one case was sensorium change in another progressive blindness in third, progressive choroidal movements in a fourth, recurrent hemiparetic attacks and in fifth, ataxia with diplopia. In six cases, the roentgenogram showed localized changes suggestive of localized pressure with other conditions suggestive of an intracranial neoplasm. In seven cases ocephalographic studies were made and led to the diagnosis and accurate localization of a tumor. Four of these cases presented marked distortion, compression, and displacement of the lateral ventricles, indicating a large tumor, but there was no definite increase in the intracranial pressure. D. W. JOSE HANSTADT, M.D.

Harding, H. E., and Nishik, A. E. Mixed Tumors of the Brain. *Lancet*, 1934, 10, 77.

Two cases of mixed tumors of the brain are reported. One of them showed characteristic disturbances of lesion of the hypothalamic region.

In 1930, Hosoi reviewed seventeen cases of teratoma and twenty-three cases of teratoid tumor and reported a case of teratoma. In all, the tumor was at or near the midline, and in most of them it originated in the pineal body or the pituitary. Less frequent sites were the choroid plexus, the tela choroidea of the third ventricle, the brain substance itself, the region of the tuber cinereum, the cerebellum, the cerebellopontine angle, and the inner surface of the dura mater. In size, the tumors varied from that of a split pea to a neoplasm measuring 8 by 10 by 12 cm. Most of them were cystic. Ectodermal and mesodermal structures were most frequent. Most of the teratomata occurred in males, and 78 per cent of the patients with a teratoma were under twenty years of age. In one of two cases reported more recently, the tumor occupied the distended sella turcica. In the other, there was a large cyst in the right hemisphere which was unique in being situated away from the midline.

In one of the two cases reported by the authors a lobulated cystic mass measuring  $2\frac{1}{4}$  by  $1\frac{1}{4}$  in occupied the entire cavity of the fourth ventricle and the foramen of Luschka and Magendie was occluded by thickened meninges. The patient was a girl six weeks old who was brought for examination because of a swelling of the anterior fontanelle which was first noted four days previously. Before the child died at the age of one year, enormous enlargement of the skull occurred. In the last two months before death the circumference of the head increased from  $17\frac{3}{4}$  to 22 in.

The author's other case was that of a girl nine years and eleven months old. As an infant, this patient had slept motionless and for longer hours than the average. Later she was noted to be very undemonstrative, never showing joy or excitement. She apparently felt fear of loud noises, darkness, solitude, and certain persons. She told her parents she was afraid, but her expression and voice were calm. She evidenced anger only by a sudden refusal to comply with suggestions. She had some sense of humor and would laugh at a funny situation. She was very loyal to her parents and a few friends, but to callers and acquaintances was so off-hand as to appear rude. She was resistant to suggestions. All her life she was subject to frequent sudden rises followed by sudden falls of temperature. Her hearing was acute, her mentality good, and her memory excellent. Her balance was never good, she had less than average ability to recover after tripping.

Three years before her death she had mumps and whooping cough in quick succession, during which illnesses she showed marked wasting. Immediately after these illnesses she drank large quantities of fluid and passed large amounts of pale urine. The polyuria continued until five weeks before her death, when it ceased abruptly. After the illnesses the patient showed a further diminution of emotional reaction. During the next winter she felt the cold intensely. During the heat of the summer before

her death the sensation of cold became so severe that she wore a coat at meals. The feeling of cold ceased abruptly about three weeks before her death. Following the pertussis her powers of concentration steadily decreased. About five weeks before her death her vision failed rapidly, but she admitted it only after attention was called to it by her staggering gait.

The findings of examination at the time of her admission to the hospital included hypotonicity of the muscles, pallor of the central area of each disk, a comatose condition, and a temperature of 101 degrees F. Later the temperature fell to below normal.

On postmortem examination a firm encapsulated tumor with a smooth lobulated surface measuring 3 by 3.5 by 4.5 cm. was found projecting from the base of the brain in the hypothalamic region behind the optic chiasm. The pituitary gland appeared to be normal.

EDWARD S. PLATT, M.D.

Roger, H., and Paillass, J.-E. Metastatic Tumors of the Brain (*Les tumeurs cérébrales métastatiques*). *Presse méd.*, Par., 1934, 42: 2093.

The authors have been able to collect only about 200 cases of metastatic brain tumor from the literature, but believe they are much more frequent than is indicated by the records.

Nearly all brain metastases originate from epithelial tumors, particularly tumors of the lung or breast. A brain metastasis may be the first manifestation of an epithelioma of the kidney, suprarenal, or other viscus. Lung metastases are generally propagated by the blood stream and involve the parenchyma, while metastases from tumors of the breast are transmitted by the lymphatics or nerves and involve the meninges or cortex.

The chief subjective symptoms of a metastatic tumor of the brain are headache and clouding of the intellect. The headache is constant and occasionally is accompanied by signs of increased intracranial tension. The clouding of the mind takes place early. Both of these symptoms seem to be of toxic rather than mechanical origin. In fact, hypertension is relatively rare in their presence. In many cases generalized convulsive seizures occur, in some, there are localizing jacksonian attacks. The tendon reflexes are frequently decreased or abolished and the pupil reactions are sluggish. Sometimes there is a mild meningeal syndrome. The general condition depends on the primary tumor rather than on the metastases. There may be a temperature of from 38 to 38.5 degrees C. suggesting encephalitis. The localizing signs are much more difficult to interpret than in cases of primary tumor of the brain. Metastases from the lung are almost always multiple and their localizing signs are very confusing. The eye-grounds and roentgenograms do not show signs of hypertension, and the spinal fluid does not present a characteristic picture.

The course of the condition is generally rapid and ends in death from extreme cachexia. Treatment is



generally hopeless, especially in cases of multiple metastases from the lungs. However, in cases in which there is a single nodule from cancer of the breast it may be successful. Roentgen therapy has been employed successfully by Huguenin, Myrdal, and Lieberow, and the authors report a case in which it was followed by cessation of the Jacksonian attacks and alleviation of the headache.

AUDREY GOME MORGAN, M.D.

Vorla, H. C., Adson, A. W. and Moersch, F. P. Tumors of the Frontal Lobe: Clinical Observations in a Series Verified Microscopically. *J. Am. Med. Ass.* 935, 94, 95.

This article reports the findings of an analysis of the clinical observations in a series of 34 cases of tumor of the frontal lobe observed at the Mayo Clinic from 1905 to January 1933 in which the tumor was examined microscopically. The cases were classified according to the anatomical site and the pathological type of the lesion. The age and sex of the patients with each pathological type of tumor are given. The authors discuss each type of tumor with regard to the duration of the symptoms before the patients came to the Clinic, the initial complaint in relation to the anatomical site of the tumor, the frequency of the principal complaints made when the patients registered at the Clinic, the principal observations made at examination, including roentgenographic examination, the mental phenomena and the side of the brain involved by the tumor in relation to the occurrence of grand mal, phasic and mental changes.

Dyke, C. G., and Davidoff, L. M. The Significance of Abnormally Shaped Subarachnoid Cisterns as Seen in the Encephalogram. *Am. J. Roentgenol.* 934, 33, 743.

The authors describe deviations in the subarachnoid cisterns which are noted in an examination of 300 encephalograms and discuss the relationship of these abnormalities to the disease process. They conclude that study of the subarachnoid cisterns in encephalograms aids in the diagnosis of tumors, aneurysms, and degenerative or hypoplastic lesions in structures in the vicinity of the cisterns. Fifteen clinical histories are reviewed.

ROBERT ZOLLINGER, M.D.

Gleason, M. A.: Tumors Arising from the Sensory Root of the Trigeminal Nerve to the Posterior Fornix. *Ann. Surg.* 935, 146.

Tumors of the gasserian ganglion are exceedingly rare though it is thought that their rarity may be due in part to their being reported under different captions. The author reports a case of perineural fibrosarcoma of the fifth nerve which was analogous to the perineural fibrosarcoma of the eighth nerve. From this case and three cases collected from the literature he concludes that clinical syndrome of perineural fibrosarcoma of the fifth nerve may be recognized. Trigeminal pain is absent

because the ganglion is not involved, but evidence of trigeminal involvement is consistent and early symptom. Such involvement is manifested by decrease or absence of the corneal reflex and anesthesia over the distribution of the nerve, particularly the ophthalmic division. With encroachment of the tumor on the cerebellum, cerebellar signs become apparent. Further pressure on the medulla and pons results in cranial nerve symptoms and pyramidal tract signs. The history is of long duration, with the late development of intracranial pressure. Periods of remission are characteristic.

In cases of tumor arising in the ganglion there is usually pain as well as anesthesia in the distribution of the trigeminal nerve. Cerebellar signs are extremely late and occur only with extension of the tumor beneath the tentorium. Perineural fibrosarcoma of the eighth nerve may be readily differentiated as it is associated with loss of hearing and lengthy history of tinnitus. In cases of tumor of the cerebellum, cerebellar symptoms occur first and extracerebellar symptoms last, and vestibular tests are of great value. JOHN WILSON EMMETT, M.D.

Ostrowski, T., and Dobrzanski, W. Peripheral Facial Paralysis Treated by Cervical Gangliotomy (Paralysie faciale périphérique traitée par la gangliectomie cervicale). *J. de Chir.* 935, 45, 6.

In the treatment of peripheral facial paralysis, various nerve anastomoses have been tried—the best of which is probably anastomosis of the facial and hypoglossal nerves—but none of them restores facial expression. Leticche in 1899 first suggested the idea of correcting the motor paralysis by excising sympathetic paralysis. The authors report in detail five cases in which this was done, and present photographs of the patients before and after the treatment. The superior cervical ganglion was resected under local anesthesia. The results are remarkably good. The plasticity of the muscles and facial expression are restored to a degree greater than that observed after any other operation. The authors therefore believe that this cervical gangliectomy is the method of choice for peripheral facial paralysis.

Although the reaction of degeneration persists and the paralysis remains, the signs of the paralysis disappear because of the change in muscle tone brought about by the resection of the ganglion. The authors are unable to explain the effect of the gangliectomy on the paralysis. They state that all explanations advanced are purely theoretical. As all paralysis is a affection of muscle tone, they believe it quite possible that surgery of the sympathetic will become the treatment of various types of paralysis.

AUDREY GOME MORGAN, M.D.

Peet, J. L. Glossopharyngeal Neuralgia. *Ann. Surg.* 935, 95, 56.

Glossopharyngeal neuralgia is rare compared with trigeminal neuralgia, but undoubtedly more

common than has been believed. From careful study after section of the glossopharyngeal nerve it has been determined that this nerve has no demonstrable motor function and that its sensory distribution includes the posterior third of the tongue, the anterior, lateral, and posterior walls of the pharynx from the lower nasopharynx to the epiglottis, including the posterior aspect of the latter, the tonsil, the pillars, the eustachian orifice, and a narrow rim along the front of the soft palate, including the uvula.

The onset of glossopharyngeal neuralgia occurs without prodromal symptoms or other warning. Talking, laughing, coughing, yawning, or sneezing may be the exciting factor, but the most common exciting factor is swallowing. Suddenly, during talking or swallowing, a sharp, knife-like pain shoots downward from the ear, the base of the tongue, or the posterior pharynx. It is gone almost as soon as it begins. As in trigeminal neuralgia, the pain occurs in paroxysms and is variously described as sharp, shooting, lancinating, knife-like, jabbing, or flashing. As a rule even the first paroxysms are described as excruciating, but in exceptional cases the patients state that the initial attack was mild although the pain was sharp. After the onset of the condition the pain is produced by stimulation of trigger zones and by talking, laughing, or eating. In the cases in which the initial attack is mild, the onset of severe symptoms is usually not long delayed. As in trigeminal neuralgia, there are intermissions and remissions and the pain may be confined for a long time to a single division of the nerve. Also in both types of neuralgia, physical examination is negative with reference to the painful areas. The diagnosis is based entirely on the history and the induction of pain when the trigger zones are touched. The cause and pathological changes are not known.

Glossopharyngeal neuralgia differs from trigeminal neuralgia in the distribution of the pain. In the latter, the pain occurs in the distribution of the nerve, usually in that of the third division. In the former, it is usually located almost entirely in the mouth, though there may be flashes of pain through to the ear. The trigger zones are also different in the two types of neuralgia, those for the ninth nerve being located within the mouth or at the lobe of the ear and those for the fifth nerve generally on the

outside of the face, along the distribution of the nerve.

In the treatment of glossopharyngeal neuralgia intracranial section of the ninth nerve is the treatment of choice as it is simple and quickly performed, it gives positive assurance against recurrence, and it does not endanger the vagus. A U-shaped incision is made between the mastoid process and the midline posteriorly. The nerve is easily located and divided with a right-angle knife.

JOHN WILTSE EPTON, M.D.

### PERIPHERAL NERVES

Saito, M. Normal Shadow of the Peripheral Nerves and Their Pathological Change in Injury and Tumor. *Am J Surg*, 1934, 26: 300.

The author presents a method for the roentgenological visualization of peripheral nerves by the endoneurial or intraneural injection of thorium dioxide solution (thorotrast). He reports the results after the injection of normal ulnar nerves and of injured peripheral nerves with and without neuromata.

The injection of the thorotrast is carried out before, during, and after operation.

Saito found that, following the injection of thorotrast, the ulnar nerve could be roentgenographed for a maximum length of 39 mm. The roentgenogram made by this method revealed not only the nerve fibers, but also the internal and external sheaths of the nerve. It is therefore possible to use the method for neurohistography. When it is applied to an injury of the nerve it will reveal the injured part clearly. As the opaque substance injected into the periphery will not infiltrate into the center over the scar on the nerve caused by the wound, a defect in the shadow will appear at the site of the scar. It is therefore probable that the method will be a great help in the roentgenological diagnosis of nerve injuries. If it is applied to the diagnosis of neuroma it will show not only the form but also the structure of the neuroma together with the stem of the nerve penetrating the tumor. This being true, it will be quite helpful in indicating treatment. It will not interfere in any way with the function of the nerve or produce any after-effects such as neuralgia. O. W. JONES, JR., M.D.



# SURGERY OF THE THORAX

Pfahler, G. E., and Vastine, J. H. The Technique and Results of Irradiation in Carcinoma of the Breast. *Am J Roentgenol*, 1935, 33, 41

The findings in these cases did not seem to support the classical theories as to the origin and nature of the tumor. The scantiness and frequent absence of dyskeratosis in these cases seemed to indicate that the lesion was not a precancerous condition. The point of origin of the neoplasm may be in the cylindrical epithelium of the milk ducts, the margin of the epidermized epithelium and the cylindrical lining of a milk duct, a sebaceous gland, a serous secretory gland, or a sudoriparous glomerule. The rate and extent of the growth of the lesion also vary according to its origin. When the tumor originates in the epidermized epithelium of the duct it grows both upward toward the epidermis and downward toward the gland. When it begins in the cylindrical epithelium of the duct, the malignant cells extend between the layer of Boll and the cylindrical layer, destroying the latter, obliterating the lumen, and rupturing the membrane and fibro elastic sheath of the milk duct to penetrate the stroma and reach the epidermis by isolated elements. This type of invasion seems to be the most common.

Deformities of the nuclei and asymmetry of the mitoses are the rule.

The clear turgescent cells show a tendency toward vacuolization, and the pluricellular confluences apparently explain the theca.

Finally the malignant cell seems to gain the epidermis by its special mobility in the interstitial spaces.

The authors reject the conception of dyskeratosis as a cancerogenic factor in Paget's disease. They state that dyskeratosis, a dystrophic condition, could not constitute the precancerous stage of a malignant lesion. They believe that the theca has a vacuolar origin and that segregation of the carcinomatous cells plays no significant part. The melanoid pigment frequently found in this cancer has quite another significance than that which prompted Drier to suggest a possible relation between Paget's disease and melanocarcinoma. All glandular epitheliomata of the breast propagate to the skin and at the epidermis become pigmented. In various tumors the melanoblasts are not cancerized. They are merely a manifestation of hyperactive tissue metabolism. There is no transition from the dyskeratotic cell to the Paget cell.

Latent cancer, such as Bowen's disease and Paget's disease, corresponds to a secreting epithelioma usually of galactophore origin but occasionally also of sebaceous or sudoriparous origin. It is quite probable that the epidermis like its derivatives, may occasionally constitute the initial focus but such an origin can be demonstrated only by examination of the entire gland.

The common embryogenesis of the original tissues of the neoplasms explains the identity of cellular types noted in each case. Whatever the point of origin. From this point of view, Paget's disease is a regional malignant neoplastic reaction of the ectoderm and its immediate or more distant derivatives.

From Schaeffer Moore

The authors have been unable to standardize the technique of treatment of carcinoma of the breast for all cases. They adapt the technique to the requirements of the individual case. As metastasis occurs more readily and widely in fat women, they distribute the irradiation more widely when the patient is fat. Also in the cases of fat women they limit the total irradiation in any one field as fat does not stand as large doses as other tissues.

The authors describe their technique for irradiation of primary carcinoma and for pre-operative treatment. In the pre-operative treatment, which requires about two weeks, the patient receives from 700 to 800 r divided in 2 doses. If she cannot or will not be operated upon, interstitial irradiation with radium is given according to the Keynes technique and this is followed by additional roentgen treatment, the attempt being made to keep the tissues saturated to the limit of normal tissue tolerance during a period of three or four weeks.

For the more advanced cases in which the supraclavicular lymph nodes are involved, at least 3 times this amount of treatment is advised. If operation is done in these cases it should be deferred for two or three months.

In postoperative cases a similar plan of treatment is carried out except that low voltage roentgen rays are used in the mammary region as well as the anterior mediastinal region as here it is necessary to send the rays directly into the chest wall. At least as much postoperative irradiation should be given as is given pre-operatively.

The authors have treated 22 cases of carcinoma of the breast by the modified Keynes method. Of 19 patients with primary lesions, 13 (59 per cent) remained free from gross evidence of the disease for a period of from fourteen to twenty-seven months. Two were alive a year or longer after the treatment, but showed gross evidence of the disease. Three died of the disease and one died of an intercurrent infection. Three who were treated for recurrence died within from six to fourteen months after the treatment.

The authors have treated 254 cases of primary carcinoma of the breast by irradiation alone, chiefly roentgen therapy. Of 195 patients, 76 (39 per cent) were living at the end of three years, but 11 still showed evidence of the disease. Of 181 patients treated more than five years before the follow up, 43 (24 per cent) were still alive at the end of that time but 4 still had gross evidence of the disease. Of 124 patients treated for inoperable carcinoma, 25 (20 per cent) were still alive and without evidence of the disease ten years later. Biopsies were not done in these cases.

The authors have treated 476 cases of recurrent carcinoma of the breast. In such cases there can be little doubt as to the correctness of the diagnosis. Of 453 patients, 21 per cent were free from recur-

toma t the end of five years, and of 388 patients, 8 per cent were free from symptoms t the end of ten years.

The patient who develops recurrence within from two t four months has slightly greater life expectancy than the patient who develops a recurrence later. This is probably due t the fact that the earlier metastases are more radiosensitive. The earlier irradiation is instituted after recurrence the longer the life expectancy.

The authors favor combined pre-operative and postoperative irradiation and surgery in operable cases. They stat that in cases of auxiliary involvement in which irradiation is combined with surgery the number of five-year cures is double that obtained in cases treated by surgery alone.

EARL O LATIMER, M D

### TRACHEA, LUNGS, AND PLEURA

Hedblom, C. A. and Van Hazel, W. The Results of Extrapleural Thoracoplasty in the Treatment of Pulmonary Tuberculosis. *J. Thoracic Surg.* 934 4 55

This article is a review of the results of thoracoplasty since it became an accepted method of collapse therapy. The authors state that the comparison of individual series of cases is difficult because certain factors such as variations in the type of cases, the operative technique, the after-care, and the economic status of the patients may influence the result.

Of the 376 patients whose cases are reviewed—including 300 of the authors' patients—over 35 per cent were free from symptoms and had a life expectancy from one to twelve years after operation. t work from one to twelve years after operation, t 1 per cent showed improvement and were able to do some work, and 33 per cent died soon after the operation or later from the tuberculous disease. Operation having no relation to the previous disease. The operative mortality which included all deaths occurring within eight weeks after the operation, ranged from 5 t 30 per cent and averaged 10.5 per cent.

Many of the surgeons whose cases are included in the series reviewed reported much lower mortality and higher percentage of cures in their more recent cases. The improvement was due to more rigid observance of the indications, improvement in the operative technique, and more careful postoperative supervision. The chief causes of death were shock, heart failure, wound infections, mediastinal flitter, and extension of the tuberculosis. These causes of failure are much less frequent today. The results reported include those in cases in which extrapleural thoracoplasty was done when knowledge of the application of collapse therapy was more limited than it is today. With increasing knowledge, the adoption of a more suitable operative procedure, and the performance of supplementary operations when indicated, much more gratifying results are being obtained.

Fischer, A. M., and Abernethy, T. J. Putrid Empyema, with Special Reference to Anaerobic Streptococci. *Arch. Int. Med.* 934 54 533

The authors define putrid empyema as a pleural effusion of varying consistency with a foul odor. They review the literature on the bacteriology of empyema, particularly anaerobic streptococci, found in peripneumonia and pelvic infections, lung abscesses, and empyema. These organisms are considered to be definitely pathogenic under certain conditions.

Four cases of putrid empyema are reported. In all, anaerobic streptococci were the dominating organisms, but in three of them other anaerobes were also present. The authors report also to cases of pulmonary abscess and one case of hepatic abscess in which similar organisms were demonstrated. In two cases Vincent's organisms were found. Bacteriological studies showed that the associated organisms were variable. They demonstrated also that the anaerobic streptococci did not all belong to the same group, two being of the viridans type, one hemolytic, and one non-hemolytic. They usually grew with a foul odor. Subcultures grew anaerobically but much more slowly as was previously noted by Prevot who also investigated principally organisms obtained from cases of pulmonary suppuration.

In the authors' cases the empyema developed as a complication of the intrapleural disease. Three of the patients died. WILLIAM V. HARRIS, M D

### HEART AND PERICARDIUM

Beck, C. S. Contusions of the Heart. *J. Am. M. Ass.* 935, 94 99

The author discusses non-penetrating trauma of the heart. He states that, lying against the sternum anteriorly, the heart is vulnerable to any sudden impact over the sternum and, buttressed against the thoracic vertebrae posteriorly, it is vulnerable to compression forces applied to the chest. There can be little doubt that the heart is subjected to many injuries. Most of them probably produce no functional disturbances and are not recognized. Indeed, even injuries that produce functional disturbances are probably not recognized in the great majority of cases.

Anginal pain is not uncommon in cardiac contusions, and the electrocardiogram produced by myocardial contusion may be similar t that of a myocardial infarct.

When the heart receives a contusion it may rupture, fail without rupture, or recover. Contusions or non-penetrating wounds of the heart are rarely fatal. The author carried out a series of twenty-five experiments in which the heart was exposed and the myocardium subjected to contusive injuries. Twenty of the experiments showed that recovery is the rule rather than the exception, and that if death occurs, it is caused by

ventricular fibrillation, rupture, or myocardial failure following tachycardia

The mechanism by which non-penetrating wounds of the heart are produced are (1) a direct blow over the precordium producing a fracture of the sternum and ribs with penetration of the broken ends into the heart, (2) contusion or compression of the heart between the sternum anteriorly and the vertebrae posteriorly, (3) the application of indirect force such as sudden compression of the legs and abdomen, (4) laceration of the thoracic viscera such as may be sustained in a fall from a height, and (5) concussion of the heart. The literature reports also cases of vagus stimulation with stoppage of the heart.

The mechanism by which rupture of the heart takes place in non-penetrating forms of trauma includes (1) bursting, like that of a toy balloon in the hand, (2) breaking of the myocardium, which is of a friable nature, (3) contusion with subsequent softening, and (4) increased intracardiac pressure such as is produced by compression applied to the legs and abdomen of individuals in whom the resistance of the heart to dilating forces is decreased.

The author reports three cases of contusion of the heart. The first was that of a man who, when he was four years of age, was kicked in the chest by a colt. The sternum and ribs were caved in. When the patient was examined by the author at the age of sixty-eight years, cardiac decompensation was found. Roentgenograms showed the transverse diameter of the heart to be markedly increased and the distance between the sternum and the vertebrae to be greatly reduced. Electrocardiograms showed auricular fibrillation and myocardial damage.

The second case was that of a man who ran into an armored truck while riding a motorcycle. Immediately after the accident he became dyspnoeic and unable to lie on his back because of severe pain in the chest, and for more than a month he was subject to attacks of dyspnoea and pain. The diagnosis of cardiac contusion was based on the facts that the patient was in excellent health and had never noted cardiac symptoms prior to the accident, circulatory collapse occurred immediately after the severe injury to the chest, and symptoms of cardiac asthma developed subsequently. As cardiac asthma develops in a variety of cardiac lesions, the author believes it may be produced by a contusive injury.

The third case was that of a man forty-nine years of age who was thrown forward against the steering wheel of an automobile and died five days later of myocardial failure. Autopsy showed two contusions the size of a dime in the posterior wall of the right ventricle and a laceration of the myocardium between these areas.

CHARLES BARON, M D

#### MISCELLANEOUS

Glaeser, H. The Treatment of Infundibular Thorax (Die Behandlung der Trichterbrust) 1934 Muenster; W, Dissertation.

All of the important facts regarding infundibular thorax are reviewed in this article. The clinical

importance of infundibular thorax depends upon the displacement and constriction of the heart. According to the author, the cardiac symptoms are due, not to a constitutional cardiac weakness, but primarily to the deformity. Only circulatory disturbances give an indication for operation. Other disturbances are rare even in pronounced cases. For disturbance of the labile state of balance developing in the course of time between the funnel protruding into the chest cavity and the heart there must be an additional constricting factor.

Purely conservative treatment (respiratory exercises, traction at the base of the funnel with strips of adhesive plaster, or suction with Bier's apparatus) may be considered only for young persons with yielding bones. Surgical treatment includes thoracotomy, resection of the funnel, and plastic procedures. Thoracotomy has always failed, and resection of the funnel had to be discontinued because it was too hazardous.

Hartleib was the first to think of excising the entire funnel after its exposure and replacing it in the defect reversed, with the convexity outward. In another case the defect left by resection of the funnel was filled with bone from the tibia.

The surgical treatment was simplified and improved by Sauerbruch. In two sittings he divided the sites of insertion of the fourth to the eighth ribs, which then had the tendency to project outward spontaneously.

Nissen elevated the sternum by means of a wire introduced behind it.

(HACKENBROCH) LOUIS NEUWELT, M D

Takino, M. The Methods of Dissemination of Metastases in the Supraclavicular, Cervical, and Axillary Lymph Nodes in Pulmonary Cancer, and Their Relation to the Lymph Vessels of the Lungs (Ueber die Verbreitungsmodi der Metastasen in den supraclavicularen bzw. zervicalen und axillaren Lymphdruesen bei Lungenkrebs und die Beziehung derselben zu den Lymphgefassen der Lunge) *Acta scholae med univ imp., Kioto*, 1934, 17: 211.

The author made clinical and roentgenological examinations in sixteen cases of cancer of the lung and a histopathological examination in two of them. He found that the localization of the metastases in the right or left supraclavicular, cervical, and axillary lymph nodes was closely related to the site of the tumor, and that the sequence of metastasis formation in these lymph nodes depended upon the growth of the tumor. Finally, he established a definite law for the development of metastases from pulmonary tumors in the different lymph nodes. He found six methods of dissemination and various combinations.

In the first and second methods of dissemination the tumor was in the right or left upper lobe and spread to the surface and apex of the lung. The metastases occurred, at least in the beginning, in the supraclavicular and cervical lymph nodes of the same side. Dullness was found in the chest

relatively early. The author believes that early dullness in the right or left supraclavicular and infraclavicular spaces, and hard, even though small enlarged nodes on the same side of the neck are of great clinical significance.

In the third and fourth methods of dissemination the tumor was near the right or left hilus and the metastases occurred at first in the opposite supraclavicular and cervical nodes. In the early stage there was no dullness in the chest as the tumor was distant from the thoracic wall. Although the author had only one case of pulmonary tumor in the right hilus, he believes, judging from the anatomy of the pulmonary lymphatics, that the third method of dissemination is not necessarily rare.

In the fifth and sixth methods of dissemination the tumor affected the right or left pleura, causing pleurisy, and the metastases appeared quite often in one of the axillary lymph nodes of the same side. Naturally in cases of primary pleural tumors the metastases develop first in the axillary nodes of the same side.

Combinations of these six methods of dissemination, such as the fourth with the sixth and the second with the fourth, also occurred.

The methods of spread of palpable lymph node metastases in cases of tumor in the upper lobes of the lung can be explained anastomatically by the pulmonary lymphatic system and the pressure mechanism of the tumor.

First and second methods. The supraclavicular and cervical lymph nodes, respectively, are connected anatomically with the tracheobronchial, peribronchial, and mediastinal nodes on the same side. Therefore the cancer cells of the primary focus in the right or left upper lobe reach the supraclavicular

and cervical nodes in the normal flow of the lymph stream, provided the latter is not disturbed by pressure of the tumor on the lymphatic vessels or nodes.

Third and fourth methods. If the tumor originates in or near the right hilus and exerts pressure early upon the right dermal tracts, the lymph flows into the cancer cells from the right upper lobe through the anastomosis between the inferior tracheobronchial lymph node and the right upper tracheobronchial lymph node into the left supraclavicular and cervical nodes respectively. If the tumor originates in or near the left hilus, the conditions are exactly reversed.

Fifth and sixth methods. Metastases develop in the axillary nodes in cases of pulmonary tumor only after involvement of the pleura. Normally there is no connection between the axillary nodes and the lymphatics of the visceral pleura but there is connection with the lymphatics of the parietal pleura. The author believes metastases by the fifth and sixth method occurs through the development of lymphatics between the visceral and parietal pleura (adhesive pleurisy).

In cases of middle and lower lobe tumors are observed. Uchida has reported a case of tumor of the lower lobe of the left lung in which a supraclavicular glandular swelling appeared first (Method 4).

As no accurate reports on metastases from tumors of the middle and lower lobes are to be found in the literature, the author has been unable to determine their routes of dissemination definitely. However, he believes that they may be explained anastomatically on the basis of the lymphatic system in the same way as metastases of tumors of the upper lobe.

LOWEN, M.D., M.D.

# SURGERY OF THE ABDOMEN

## GASTRO-INTESTINAL TRACT

Aird, I Perforation of Carcinoma of the Stomach into the General Peritoneal Cavity *Brit J Surg*, 1935, 22 545

Aird states that there is no clear clinical picture upon which a pre operative diagnosis of perforated carcinoma of the stomach can be based. Pre operative diagnosis is rendered difficult also by the relative infrequency of this catastrophe in even the widest surgical practice. After reporting a case of his own Aird reviews seven observed in the Royal Infirmary, Edinburgh, and seventy-one cases collected from the literature.

Aird's case was that of a sailor twenty-seven years old who, while out walking was seized with violent epigastric pain. After an hour the pain became generalized throughout the abdomen. Vomiting of yellow bile failed to relieve it. There was a past history of epigastric pains not consistently related to food taking which had been gradually becoming more severe.

At the time of the patient's admission to the hospital, six hours after the attack, the pain had eased and the vomiting had ceased. The temperature was subnormal. The pulse was 120 but of good quality. Tenderness and rigidity were intense and generalized but most marked in the epigastrium. There was no palpable tumor or distention and no dullness in the flanks. A diagnosis of perforated peptic ulcer was made. At operation in which the abdomen was opened by a right paramedian rectus displacing incision, the peritoneal cavity was found to contain gas and a serofibrinous exudate, and a perforation 1 in in diameter was discovered on the posterior wall of the stomach near the lesser curvature, 2 in from the pylorus. The edges of the opening were ragged, white, and crumbling. The perforation had occurred through a saddle-shaped ulcer involving the lesser curvature and the greater girth of the stomach. In the lesser omentum there was a mass of hard glands. The perforation was closed with great difficulty on account of the friability of the tissues. Microscopic sections of the omental gland disclosed a highly cellular adenocarcinoma with no glandular arrangement whatever. The immediate convalescence was uneventful, but on account of the metastases, a radical operation was not indicated.

Analysis of the seventy-one cases collected from the literature shows that an exact pre-operative diagnosis of perforated carcinoma is possible and likely only if the gastric tumor has been diagnosed previously. In two thirds of cases of perforated carcinoma of the stomach the condition runs a fulminant course with signs and symptoms closely re-

sembling those of perforated peptic ulcer. In one-third, the perforation is more or less silent, pain and abdominal rigidity being slight or absent. In both of these groups the perforating tumor is nearly always of the ulcerating variety and is often situated on the lesser curvature near the pylorus. In about 50 per cent, metastases are already present when the perforation occurs. Primary cancer of the stomach tends to perforate atypically, the symptoms being either mild or gradual or death resulting in a few hours from septic peritonitis. The immediate operative mortality approaches 60 per cent. Immediate gastrectomy has been successful in only seven cases. The safest and most effective treatment appears to be simple closure of the perforation supplemented by gastro-enterostomy and if removal is possible, later gastrectomy. Peritonitis may occur in cases of cancer of the stomach without actual perforation of that organ.

JOHN W. NUZZUM, M.D.

Friedenwald, J., and Feldman, M. The Unstable or Irritable Duodenum. Clinical Observations in 100 Cases. *J Am Med Ass*, 1934, 103 2007

During the last few years clinicians have begun to recognize an unstable or irritable duodenum in addition to the ulcerated duodenum. The former may be responsible for a bizarre syndrome. There still is much confusion in defining it.

The cause may be unknown. When there is no evidence of organic disease, a nervous reflex or allergy may be considered. In addition, there may be a mechanical etiological factor such as a congenital abnormality, adhesions, or compression of the duodenum. Especially important are the adhesive processes secondary to chronic cholecystitis, visceropexy, or abdominal surgical procedures. Chemical causes are manifested by changes in the gastric secretion.

The symptoms may simulate those of duodenitis, duodenal ulcer, cholecystitis, appendicitis, or any other abdominal disease. On the other hand they may be quite atypical, the patient complaining only of an abnormal appetite, nausea, emesis, epigastric discomfort, and headache. Abdominal pain is usually absent. As a rule the diagnosis is based on a history of vague subjective neurotic symptoms such as headache, dizziness, insomnia, and exhaustion in a high-strung, neurasthenic, irritable, patient. Spasticity elsewhere in the gastro-intestinal tract, manifested by cardiospasm, pylorospasm, gastric spasm, or spastic colitis is common. Roentgen evidence affords a far more conclusive basis for diagnosis. The entire duodenum or any part of it may show dysfunction plus irritability. There may be (1) increased motility with frequent or infrequent emptying, (2) transient irregularities along the borders, (3) tran-



ident specific manifestations (4) tenderness and sensitiveness over the duodenum, and (5) absence of a definite ulcer filling defect. Although motility is markedly accelerated, the duodenal cap does not always empty itself completely enough. This is characteristic of the typical case.

Therapy should be directed at the restoration of normal duodenal tone. This is accomplished best by regulation of the diet, rest and improvement of the condition of the nervous system.

SANTER, J. FOOLSBOW, M.D.

Kantor, J. L. Regional (Terminal) Ileitis. Its Roentgen Diagnosis. *J Am M Ass* 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

This article is a preliminary report based on six cases of regional ileitis surgically explored. In four of the cases the operation was performed and the pathological examination made at Mount Sinai Hospital, New York, and in the two others they were carried out elsewhere. In the former the ultimate diagnosis was non-specific ulcerative granulomatous inflammation of the terminal ileum. In the latter the operation was done prior to the introduction of the term, regional ileitis, but the findings were the same as those in the other cases as regards the presence of thickening and ulceration and the absence of new growth, tuberculous, and other known specific inflammations and neoplasms.

Pain and diarrhea occurred in all of the cases, fever in five, malnutrition in four and a mass in three. The patients were males ranging in age from sixteen to forty-two years. Three of them were in the early thirties.

Kantor states that roentgen examination of the small intestine has not received sufficient attention. He advises frequent careful observation of a progress meal from the time the cecum begins to fill until the time the ileum should normally be empty.

In regional ileitis not only the ileum but also the colon may show an abnormality. The involvement of the cecum is usually a spastic manifestation, but in some cases the disease process may involve the colon by adhesion or fistula formation. Under the latter circumstances the deformity of the colon will be fixed.

The important changes in the ileum are a constriction, filling defect and frequent dilatation of the loop proximal to the defect with stasis. In three of the cases reviewed the contour of the ileum proximal to the lesion seemed abnormal. The striking feature is the "string sign" representing the actual lesion. This is thin, linear shadow often irregular suggesting cotton string extending more or less continuously from the last visualized loop through the filling defect to the ileocecal valve.

The string sign appearance must be differentiated from the streak like filling of spastic segments of the small intestine. In the latter the defect is inconsistent, wider, denser and smoother. The string sign is constant.

Regional ileitis must be differentiated also from a filled appendix and from tuberculous, sarcomatous, and syphilitic of the terminal ileum.

The author concludes that although the string sign is not necessarily pathognomonic of regional ileitis, this condition should always be borne in mind when the string sign is found.

KARL E. BARTER, M.D.

Gall, R., and Benedetti, G. An Experimental Study of Transplantation of the Ileocecal Sphincter in Anastomosis Between the Small Intestine and Colon (*Studio sperimentale sul trasloca dello sfintere ileocecale nelle anastomosi fra tenue e cieco*). *Arch Ital di chir* 934, 35, 57.

Aside from the extensive ileocecal resection for malignant disease, in which it is impossible to save the ileocecal sphincter, there is a series of conditions (diverticulitis, chronic stasis of the proximal colon, benign tumors) in which ileocecal anastomosis is advisable and it is important to preserve the sphincter. The authors review the investigation methods of ileocecal anastomosis, the purpose of which is to reconstruct a valvular apparatus and thus prevent reflux. The experimental technique recently devised by Weiss has undoubtedly given good results, judged functionally roentgenologically and anatomically but may not be equally successful in man. With regard to the procedure of this kind the doubt persists as to whether they would be efficient in every case and whether the valvular function would be permanent.

The ideal procedure in the type of case under consideration would be to keep the end loop of the ileum with its sphincter intact and transplant it into the colon at the desired site. The first experiments to solve the problem were undertaken by Cannon in 1917. As Cannon's technique is attractive because of its comparative simplicity, Gall and Benedetti repeated and extended Cannon's experiments. At the same time they made a study of the anatomy and function of the sphincter and its appearance in different physiological states. They review the literature on the function of the sphincter from the classical conception that the valve is passive to the new theory that it is an active sphincter, physiological entity with a regulating function. They state however that its morphology, function, and reflex coordination with the rest of the intestine are not yet completely settled.

In six dogs the authors did an oblique terminolateral transplantation of the ileocecal sphincter into the ascending colon at various distances from the cecum. The appearance of the valve as studied roentgenologically in different conditions of the stomach (fasting and after meals) and its continuity was tested directly in the relaxed and contracted state by hydrostatic pressure and roentgenological after the administration of an opaque enema.

The functional state of the sphincter after transplantation according to the filling of the stomach. When the stomach was secreting actively the ileocecal

sphincter could not be forced, while in the fasting state it could always be made to yield to the pressure of an enema. These contrasting results are the best proof that the transplanted sphincter is capable of maintaining its structure and function. Apparently these will continue indefinitely if the anatomical conditions on which they depend are preserved. While in some cases the remaining colon was increased in size and its walls were hypertrophied, the end of the ileum showed practically no change.

The authors conclude that the ileocolic sphincter is intimately connected reflexly with other parts of the gastro intestinal tract and its action is determined by a reflex of gastric origin. In the fasting condition the sphincter is incapable of opposing a colo ileal reflux, while during digestion it is perfectly closed. In making a roentgenological diagnosis of insufficiency of the sphincter it must be remembered that there may be a physiological retrograde filling of the ileum without a lesion of the sphincter. Transplantation of the sphincter into the colon by Caucchi's method is technically easy, and the transplanted sphincter will probably retain its function indefinitely.

The article is illustrated and is followed by a bibliography. M. E. MORSE, M.D.

**Tassi, D.** The Value of a Negative Exploratory Puncture in Suppurative Appendicitis (Valore della puntura esplorativa ad esito negativo nelle appendicitis suppurative) *Polidm.*, Rome, 1934, 41 sez. prat. 2005.

The author reports in detail seven cases of acute suppurative appendicitis and periappendiceal abscess in which a negative exploratory paracentesis was followed immediately by reduction of the fever, the edema in the right lower quadrant of the abdomen, the pain, and the leucocytosis and after a few hours by rapid disappearance of the inflammatory abdominal tumor. At operation performed later, the previous presence of an inflammatory process of the appendix was proved.

Tassi attributes the favorable effect of the exploratory puncture to a humoral modification—an "autohæmo-autosero-autovaccination"—following the small hæmorrhage produced by the passage of the needle through the abdominal wall.

A. LOUIS ROSE, M.D.

**Costa, G.** Postoperative Appendiceal Fistulæ (Contributo allo studio delle fistole entero-cutanee post-operative appendicistiche) *Clin. chir.*, 1934, 10 1115.

The author reports five cases of postoperative appendiceal fistula. The first case was one of tuberculous typhlo appendicitis in which chronic tuberculosis was complicated by acute inflammation of the appendix, the second, one of suppurative appendicitis following a primary carcinoma of the appendix, the third, one of true appendicitis in which operation was performed on the twenty-fifth day, in the period of suppuration, the fourth, one of ordi-

nary acute appendicitis with an infiltration not yet absorbed, in which operation was performed on the sixty-second day after the beginning of the disease, and the fifth, one of true acute appendicitis in which operation was performed on the third day of the attack. The sterocoraceous fistulæ in these cases developed at various periods after operation.

On the basis of these cases and a review of the literature Costa discusses postoperative appendiceal fistulæ in general and divides them into two groups—those due to a pathological condition such as cancer or tuberculosis and those resulting from defects in the technique of operation. He states that the higher the perforation the greater the danger. The treatment of such fistulæ is surgical. The operation may consist of lateral enterorrhaphy, enterectomy, simple entero-anastomosis, or entero anastomosis followed by enterectomy. The choice of procedure must be determined by the requirements of the particular case. AUDREY GOSS MORGAN, M.D.

**Mitchell, G. A. G.** The Innervation of the Distal Colon. *Edinburgh M. J.*, 1935, 42 11.

Our knowledge of the autonomic nervous system is still very incomplete. Surgical intervention has far outstripped anatomical and physiological knowledge. As a result, operations based on false conceptions have done much to discredit legitimate surgery of the autonomic nervous system. The practical advantage and importance of an exact knowledge of the anatomy of the autonomic nerves are obvious. This discussion of the innervation of the distal colon is based on dissections of fifteen stillborn babies.

The distal colon is plentifully supplied with nerves arising from several sources and pursuing different pathways. Lying between the origins of the mesenteric arteries, on the anterior and anterolateral aspect of the aorta, are delicate bundles of nerve fibers, from four to twelve in number, which are disposed in the shape of a closed fan with the narrower end upward or in the form of two or three discrete bundles. These are called the intermesenteric nerves.

Above, the intermesenteric nerves are continuous with the cœliac plexus and communicate with the aorticorenal ganglia. Below, some of their fibers form a plexus around the origin of the inferior mesenteric artery and others pass directly downward into the superior hypogastric plexus. Between, they are united by several fine branches, but a true plexus is formed only in a few instances where the fibers interlace at the lower ends. Opposite the hilum of each kidney these nerves give off from two to six slender branches which pass to the aorticorenal ganglia or directly to the renal plexuses. In most cases an additional one or two delicate branches pass upward and outward from the outer and lower parts of the intermesenteric nerve group to take part in the formation of the renal plexuses. At their lower ends these nerves communicate with the inferior mesenteric plexus and appear to be more constant on the right side.

The intermesenteric nerves are joined laterally on both sides by three or four rami from the upper half of the lumbar sympathetic chain. The upper ramus (or rami) joins the intermesenteric nerves directly. The lower two not uncommonly fuse before they join the termination of the intermesenteric nerves or the beginning of the superior hypogastric plexus. These rami are called the lumbar splanchnic nerves. The plexus which surrounds the inferior mesenteric artery is formed by branches from the intermesenteric and lumbar splanchnic nerves. It is generally agreed that the main sympathetic supply of the distal colon passes through the inferior mesenteric plexus and its branches. By some it is maintained that parasympathetic fibers also reach the colon by this route. The sympathetic fibers pass through the lumbar splanchnic nerves and by way of the inferior mesenteric nerves from the celiac plexus.

The inferior hypogastric or pelvic plexuses are situated on each side of the rectum or bladder. They are composed of an intricate meshwork of nerve fibers embedded in firm connective tissue.

In summarizing the author states that the distal colon receives its nerve supply from 1 main sources: (1) the inferior mesenteric plexus, and (2) the hypogastric nerves and plexuses. The former supply is mainly, and possibly entirely sympathetic in nature. The latter there may be both sympathetic and parasympathetic fibers, but parasympathetic elements predominate.

JONES R. C. M. M. D.

Mont, F. Cancer of the Lower Colon (Sigmoid) and Rectum. *New England J. Med.* 1934. 440

The treatment of cancer of the sigmoid and rectum has become more promising with improvement in the diagnosis and in the safety and efficiency of the operative technique. According to Jones 1 per cent of all carcinomata occur in the intestinal tract, 70 per cent of intestinal carcinomata occur in the rectum, and 60 per cent of rectal carcinomata may be correctly diagnosed.

Mont states that a new point of view must be developed in the mind of both laymen and physicians to the relative safety of surgery and the curability of cancer of the sigmoid and rectum. It is lamentable that a large proportion of persons with cancer of the sigmoid and rectum are first seen by the surgeon too late for operation. In the public institutions of America from three-fourths to one-fifth of patients with cancer of the rectum are inoperable at the time of their admission and the remainder are on the borderline of operability. In 7 per cent of cases however the incidence of operability ranges from 1 to 60 per cent.

In cases in which radical operation is possible and is performed by experienced surgeons the mortality has been reduced remarkably. Coffey reported a series of forty-seven cases in which there were only two deaths in the Lasey Clinic series of forty-six cases with no deaths. Moreover the incidence of five-year cures seems to be higher in

cases treated by radical operation than in those treated by lesser procedures.

If the incidence morbidity and mortality of cancer of the colon are to be generally lowered in keeping with the demonstrated possibilities, the improvement must be brought about by education. The laity and physicians must be taught to recognize the importance of initial symptoms such as change in bowel habit, pain, and bleeding. Practitioners must be induced to apply faithfully all the diagnostic measures at their command, including abdominal palpation and digital, proctoscopic, chemical, microscopic, and roentgenological examinations and surgeons must master the difficult and often tedious technique of preparation, operation, and after-care.

Among the difficulties confronting the surgeon who wishes to perform a suitable radical operation is the almost universal horror of an abdominal mass on the part of physicians as well as laymen. The attitude does not seem justified by the experience of persons with properly made colostomy that is reasonably well cared for. 31 of 395 have been sacrificed and much misery has been endured because of the refusal to submit to colostomy.

It is quite generally held that in lesions of the left colon a one-stage resection with immediate closure is best because of the storage function, the abundant growth of bacteria and the tendency toward obstruction in this part of the colon. Therefore in the majority of cases of such lesions the author performs preliminary resection of a permanent colostomy. The use of the likelihood procedure lessens the danger of shock and the odds that of intra-peritoneal leakage but may introduce dangers of its own besides greatly extending the period of hospitalization. After the performance of a colostomy for its defecating action, the surgeon may still perform the likelihood operation if he doubts his ability to carry out a resection in continuity with safety. The importance of spinal anesthesia and blood transfusion is discussed.

The author reports eighteen cases in which a radical operation was performed according to the principles outlined in the period from 1923 to 1933. The operative mortality was 17 per cent. Five (28 per cent) of the patients died of recurrence. Five could not be traced but it is known that five have been free from recurrence year after the operation. Fifty per cent of the patients are still alive and free from recurrence.

M. F. MONT, M. D.

#### LIVER, GALL BLADDER, PANCREAS, AND SPLEEN

Lamontant C., Bertrand, I. and Patel, J. Considerations on Solitary Proliferated Adenoma of the Liver. *Cancer Report (Case Illustrations and Pathologic Picture of the Liver - progress of new observations presented)*. *French Med. J.* 1934. 92. 9

Solitary circumscribed adenoma occurring in the liver in the course of hepatitis are relatively rare

They are usually found at operation or autopsy. Of the cases reported, the tumor was diagnosed clinically in only two.

The case reported by the author was that of a woman twenty-two years of age who complained of intermittent abdominal pain and a sense of heaviness in the epigastrium which had begun two years previously and had been followed by the appearance of an abdominal tumor.

Physical examination revealed a painless, smooth, rounded mass, the size of the head of a newborn infant, which extended below the umbilicus and seemed to be attached to the liver. On roentgenographic examination the attachment to the liver appeared to be confirmed and the diagnosis rested between adenoma and hydatid cyst. The reactions of Weinberg and Casoni being negative, the final diagnosis was adenoma of the liver.

Operation disclosed a nearly black tumor, the size of the head of a newborn infant, which was attached to the anterior border of the right lobe of the liver by a pedicle from 9 to 10 cm in diameter. On the surface of the neoplasm, which was relatively smooth, were numerous tortuous dilated veins. The liver was free from other nodules. The tumor was resected by a wedge-shaped incision and the defect closed by U sutures and covered with omentum. Uneventful recovery resulted.

Microscopic examination of the tumor revealed in some areas a cord-like arrangement of epithelial cells closely resembling normal liver. Between the cords were endothelium-lined sinusoids. In other areas the epithelial cells formed acini containing a minute amount of fluid. At no point were there cysts. The stroma consisted of rather dense thick bands dividing the tumor into lobules.

In discussing the treatment the authors emphasize the difficulty of obtaining hæmostasis.

ALBERT F. DE GROAT, M.D.

Baroni, B. Studies and Researches on Intramural and Interstitial Calculi of the Gall Bladder (Studi e ricerche sulla calcolosi "intramurale" e sulla calcolosi "interstiziale" della cistifellea) *Arch. ital. di chir.*, 1934, 38, 273.

The author presents a fairly complete review of the literature on intramural and interstitial calculi of the gall bladder. Such calculi are relatively uncommon. Early investigators were of the opinion that intramural calculi were ordinary small gall-bladder calculi which had become included in the wall of the gall bladder through lesions in the mucosa. Others believed that they were formed within the wall of the gall bladder and regarded the so-called glands in the gall-bladder wall described by Luschka as of importance in their formation.

Baroni reports three cases of intramural calculi of the gall bladder. The history in these cases was the same as that in most cases of gall bladder disease. In two cases roentgen studies showed no filling, and in one case, only faint evidence of filling.

In the first case the intramural calculi were not diagnosed at operation, but on the basis of the study of this case the pathological anatomy was recognized readily at operation in the second and third cases. Macroscopic study of the specimens showed an increase in the size of the gall bladder in two cases and a decrease in one case. The wall of the gall bladder cut with some difficulty. Small hard masses could be seen and felt within it. The wall was pink and presented nodular yellow areas, in the centers of which the calculi were visible. The calculi were located irregularly in the peritoneal as well as the aperitoneal portions of the gall bladder and were at various depths from the surface. Most of them were in the subserosa and muscularis, but some were in the submucosa. In a few instances the surface of a calculus was exposed in the lumen of the gall bladder. The calculi varied in number in the three cases. They were usually friable and often of a deep chestnut color with at times streaks of dirty yellow. They varied in size from that of a pinhead to about 1 cm in diameter. Grossly, the mucosa was hypertrophic and presented round, scar-like areas up to 5 mm in diameter with indefinite margins, which were often a dark green but sometimes yellow in the center, elevated above the level of the mucosa, and either bare of mucosa or covered by a tense smooth mucosa. These elevated areas corresponded to the areas containing the calculi.

Histological study yielded findings which tended to be different in the three specimens and were not easily correlated. In the first specimen there was a thickened mucosa much like that of strawberry gall bladder with hypertrophy of the tunica muscularis and hyperplasia of the connective tissue in the submucosa and subserosa. Tubular invaginations of the mucosa (which may be called Luschka canals) were present. These sometimes extended to the subserosa and often contained calculi of various dimensions. Immediately surrounding the calculi the mucous membrane was much like that in the gall bladder. Perivascular infiltration was noted especially in the areas surrounding the canals. There was some histiocytic and fibroblastic proliferation, and some lipid degeneration of the cells. In certain areas the stones were invested by connective tissue without intervening epithelium.

In the second case the findings were similar except that many of the spaces were not related to the Luschka canals but were rather isolated new cavities. The tissues surrounding these cavities were composed chiefly of epithelioid cells and were involved by some phase of a degenerative process or by lipid infiltration, containing granules of bilirubin, calcium, cholesterol and its esters, and a yellow pigment. These substances fused to form small calculi which in turn sometimes fused.

In the third case the mucosa was hypertrophic but without villi and was poor in Luschka canals. The submucosa was the site of foci of cellular infiltration and connective tissue hyperplasia. There was

some trophy of the smooth muscle. The spaces noted were much the same as those in the second case, not Luschka canals.

On the basis of these findings the author attempts to explain the formation of such calculi. He believes that in the beginning there are present in the submucosa and subserous connective tissue cells with morphological characteristics between those of the fibroblast and epithelioid cell but more rounded, presenting a poorly tolced nucleus and a granular cytoplasm, and containing some doubly refractile bodies. These cells soon disintegrate and become infiltrated with fat. In this stage small granules of bilirubin and cholesterolin esters appear together. Soon the cell disappears entirely leaving only the débris of cholesterolin, fats, bilirubin, and calcium. Epithelioid cells surround this material much as they would surround a foreign body and form foreign body giant cells. These cells eventually become involved in the degenerative process and their débris forms a covering for the original nidus. This process is then repeated varying number of times. This precipitation seems to occur periodically as similar phases of it are often noted in different parts of the same specimen. Such a process may take place anywhere within the wall of the gall bladder quite independently of an epithelial coating and without communicating with the lumen of the gall bladder.

The indications are that these intramural calculi have a dual origin—one within the Luschka canals and the other truly interstitial following the process described or some similar process. The causes of calculi formed in the canals are probably similar to those of gall stones in general, whereas the calculi formed interstitially are related primarily to degeneration and calcification without inflammation or infection. The author believes that the basic changes may be related to the changes in straw berry gall bladder.

A fairly complete review of the literature and a complete bibliography are presented.

A LOUIS ROSE, M.D.

Webb-Johnson, A. E., and Muir, E. G.: Cysts in the Region of the Pancreas: With Notes of Cases. *Br. J. Surg.* 1934. 24.

Cystic tumors in the region of the pancreas are among the least common of all abdominal cysts. A woman fifty-two years of age was operated upon for cyst 1 ft. in diameter which lay behind the pancreas and was attached to the spleen by venous channels. The wall of the cyst was formed mainly of fibrous tissue, but contained definite muscle fibers. The nature of the muscle could not be determined. The presence of muscle fibers in the wall and the septa of the cyst suggested a teratomatous origin.

GERMOT A. COLLIER, M.D.

# GYNECOLOGY

## UTERUS

**Lukacs, M** The Action of Thymophysin—Extract of Thymus and Hypophysis—on the Contractions of the Uterus Its Use in Obstetrical Therapeutics (L'azione dell'estratto biglandolare associato del timo e ipofisi "thymophysin" sulle contrazioni uterine. Suo uso nella pratica terapeutica ostetrica) *Riv ital di ginec*, 1934, 17 305

The author states that thymophysin, a combination of extract of the thymus and extract of the posterior lobe of the hypophysis, was first reported as a new remedy by Temesváry at the Gynecological Congress held in Vienna in 1925. Temesváry's report was a sequel to the reports of other investigators who demonstrated indications and contraindications for the use of pituitrin and discovered that extract of the thymus is capable of increasing the contractions and the muscular tone of the uterus.

To prepare thymophysin, Lukacs used commercial thymus extract as well as his own extract. In a series of experiments he found that when extract of the thymus gland was used with an extract of the posterior lobe of the hypophysis it prolonged the effect of the hypophyseal extract.

In obstetrical practice Lukacs has used thymophysin to increase the pains in primary and secondary inertia, in the period of dilatation from 2 cm to complete dilatation, in the period of expulsion, in the cases of elderly primiparae and multiparae with an intact or ruptured bag of waters, in premature and early rupture of the membranes, in marginal and lateral placenta praevia, and in normal labors in which there were fetal indications for its use. He has had no opportunity to confirm the results obtained with it by others in polyhydramnios, twin births, rigidity of the portio, hypoplastic uterus, or deformity of the pelvis of the first grade.

He regards the use of thymophysin as contraindicated by marked deformity of the pelvis, hydrocephalus, fetal macrosomia, shoulder presentation, spastic and tetanic contractions, threatened rupture of the uterus, grave nephritis, especially that associated with hypertension, headache, and visual disturbances, decompensated cardiopathy, diffuse arteriosclerosis, and myocarditis.

The thymophysin is injected intramuscularly (into the gluteus muscle), not by vein. The syringe must be free from alcohol as alcohol diminishes the action of the thymophysin.

To induce premature labor or hasten protracted labor the thymophysin was given sometimes in doses of 0.2 c.cm. repeated at intervals of twenty-five or thirty minutes after the previous administration of castor oil or an enema and sometimes in doses of 0.5 c.cm. It was found that the uterus

reacted sooner and more positively to doses of 0.5 c.cm.

In primary or secondary inertia in the period of dilatation, 1.1 c.cm. was generally given and repeated, if necessary, after an hour. The uterus began to contract after from three to ten minutes. The contractions lasted for from thirty-five to forty-five seconds and always showed a physiological rhythm, being repeated every two or three minutes. They continued to occur to the end of labor.

The value of the extract is apparent especially in cases of premature and early rupture of the membranes in which there is great danger of infection of the mother and danger of asphyxia and death of the child necessitates rapid delivery.

After reporting eight illustrative cases the author draws the following conclusions:

- 1 The action of thymophysin on the uterine musculature is rapid and certain, provoking intense contractions which are always within physiological limits and continue for many hours.

- 2 Thymophysin is specific for uterine inertia in the period of dilatation.

- 3 A single dose should not exceed 1 c.cm. If necessary this dose may be repeated after an hour.

- 4 The injection should be intramuscular (gluteus, thigh).

- 5 Thymophysin should not be given during uterine fatigue.

- 6 The sooner its administration after sensitization of the uterus the surer its effect. It acts only on a uterus already sensitized, that is, after the pains of labor have already begun, or on a uterus that has been sensitized by small successive doses of thymophysin.

- 7 Labors influenced by thymophysin are characterized in general by a rapid course not only during the second stage but also during expulsion of the placenta, and by a normal loss of blood.

- 8 Thymophysin never causes tetaniform contractions, and has no direct action on the blood pressure.

- 9 It may prove of great aid in operative interventions, especially the use of forceps.

CLARA RAVEN

**Ahlborg, G** On Spontaneous Rupture of the Myoma Capsule. *Acta obst et gynec Scand*, 1934, 14 368

The author reviews the seven cases of spontaneous rupture of a myoma capsule which he was able to find in the literature and reports a case of his own. The latter was the case of a woman forty-three years old who had a solitary myoma the size of a man's head. A sudden, moderately painful enlargement of the abdomen occurred. At operation two weeks

later a part of the myoma as large as two fists was found extruded through rupture in the capsule and adherent to the transverse mesocolon.

The cases reported in the literature show that rupture of the capsule of a myoma may result from disturbances in the nutrition of the myoma accompanied by rapid growth of the tumor pressure necrosis in the capsule and reduction of the elasticity of the capsular tissue with maintenance of the contractile power of the uterus.

Hinselmann, H.: Ten Years of Colposcopic Diagnosis of Carcinoma (Zehn Jahre Carcinom-Diagnose mit dem Kolposkop). *Acta Chirurgica* 1931, 35.

The colposcope was constructed and introduced into the technique of gynecological diagnosis ten years ago. While it was originally intended for the detection of carcinoma of the portio not detectable

with the naked eye, it has proved of value also in the study of advanced carcinoma of the portio. Even when the diagnosis of advanced carcinoma has been satisfactorily established, the colposcope permits a considerably more exact and sure determination of the limits of the tumor than is possible with the naked eye. It shows which parts are already involved in the carcinomatous growth and which are still free. This determination is of great value especially in the choice of the site for biopsy. In this manner the colposcope prevents an uncertain or possibly negative diagnosis due to removal of the biopsy specimen from the wrong place. It shows dependably and exactly the extension of the carcinomatous process on the surface, thus preventing the surgeon from making the line of extension in the carcinomatous area instead of in healthy tissue.

In the early diagnosis of carcinoma the colposcope has fulfilled anticipation in a different manner than was expected at the time it was constructed.

The mutual changes of carcinoma are not, as one might assume, the advanced changes on a small scale. In general, incipient carcinoma is not manifested as a small tumor or ulcer. Its occurrence in this form is exceptional. Of 30 incipient carcinomas diagnosed with the colposcope in the course of two years, only one was in the form of small circumscribed ulcers or nodules.

In order to understand the true form of incipient carcinoma it is necessary to go back and start especially. For the changes representing the initial stages of carcinoma of the portio it was found advisable to make up a new nomenclature and classification (though some of the cases the findings corresponded to the microscopic changes that had heretofore been considered the signs of incipient carcinoma). For practical reasons use of the term "precancerous" should be avoided. Moreover in order not to incipit new microscopic conceptions, it is better not to use the term "beginning carcinoma." Perhaps in the future it will be found necessary to enlarge the classification now proposed. For instance to designate as 4c a the type now known as

4c (hyperplasia of atypical keratinizing epithelium involving the atrophic glands) when the hyperplastic epithelium is limited to the excretory ducts of these glands, and as 4c $\beta$  when the lamina of the glands has become involved, designating as Type 5 that in which the hyperplastic atypical epithelium is entirely superficial.

For the correct performance of colposcopy the requirements must be met. First, a complete colposcopic examination must be made of every patient. When this is neglected the practitioner deprives himself of the advantages of colposcopy. It cannot be said that a clinic performs colposcopy if it does not insist that this basic rule be followed. Any deviation from this rule means that the incipient stages of carcinoma of the portio are not always discovered. The second requirement is that there be subsequent control by means of microscopic examination, particularly when the carcinoma has not yet ulcerated. If the colposcopic findings are not followed by histological studies, correct understanding of the pathological changes on the surface of the portio is general and in the early stages of carcinoma is particularly impossible.

(Schiller) JOSEPH W. BRYMAN, M.D.

Klafsek, E., and Marvath, E.: Sarcoma of the Uterus and Vagina (Uter Sarcoma des Uterus und der Vagina). *Zeitschrift für Gynäkologie* 1931, p. 175.

The authors made statistical study of the sarcoma material of the First Gynecological Clinic of the University of Vienna covering the period from 1901 to 1931. Of the 1,358 cases of sarcoma operated upon during this period, sarcoma was found in 44 (3.2 per cent). The incidence of sarcoma is in agreement with that given in other reports from Vienna. Of the 1,358 cases of uterine carcinoma observed during the same period, the tumor was in the corpus in 36, in the cervix in 492 and in the vagina in 97, whereas of the 44 cases of sarcoma the tumor was in the corpus in 35, in the cervix in 6, and in the vagina in 3. For every 4 carcinomas of the corpus there was 1 sarcoma of the corpus; for every 125 carcinomas of the cervix, 2 cervical sarcomas; and, in general, for every 40 uterine carcinomas, 1 uterine sarcoma.

Sarcomas of the corpus uteri are divided into sarcomas of the wall and sarcomas of the mucous membrane. Of 30 sarcomas of the wall of the uterus, 5 are sarcomas arising in myomata as indication of the tendency of myomata to undergo sarcomatous degeneration. The symptoms of sarcomas in myomata are indistinguishable from the symptoms of myomata. The failure of roentgen irradiation for treatment of myoma may be an important finding. The ages of the patients in this group ranged from twenty-six to fifty-five years, whereas diffuse sarcomas of the wall and of the mucous membrane were found only in cases over forty-five years. A familial tendency toward malignant tumor formation could be determined in only 1 instance. In 4 cases, sarcomas are found

in purely submucous myomata. Once tuberculosis was found combined with sarcoma. The mortality in this group was 16 per cent. Twenty one of the patients are still living. Thirteen have survived for five years. All were treated surgically.

On histological examination the most common findings were spindle celled sarcoma (7 cases) and myocellular sarcoma (5 cases).

Even in cases of diffuse sarcoma of the wall of the uterus and sarcoma of the mucous membrane there was nothing characteristic in the history. The prognosis in this group was definitely less favorable, only 2 of the 7 patients surviving for one year. Some of the patients were treated by operation and some by irradiation.

The symptoms of sarcoma of the cervix were similar to those of carcinoma of the cervix. In one case the former condition was thought to be a cervical carcinoma and was treated by radical vaginal operation. Of the 5 cases, 2 were operated upon and 3 were treated by irradiation. The 2 patients who were subjected to operation remained cured for four and eight years, respectively, and 2 of the 3 who were treated by irradiation survived for more than five years after the treatment.

Both of the vaginal sarcomata were soon fatal.

In all cases in which autopsy was performed widespread metastases were found.

Most cases of diffuse sarcoma of the uterine wall and uterine mucous membrane come for treatment at a relatively advanced stage. Consequently, the prognosis is more unfavorable. In the cases reviewed no permanent cures were obtained.

Of the cases of sarcoma of the cervix, a permanent cure was obtained in 3. One of the patients treated for this condition was still alive after more than three years. (FROMMOLT) JACOB E. KLEIN, M.D.

#### ADNEXAL AND PERIUTERINE CONDITIONS

Wallart, J. The Rete and the Segmentary Arrangement of the Ovary (Le rete et la disposition segmentaire de l'ovaire). *Gynéc. et obst.*, 1934, 30, 517.

The rete ovarii, an epithelial formation sometimes found in the hilus of the ovary, has received little attention from investigators within recent times. The author, who has made extensive investigations of this structure in human beings as well as in animals, is of the opinion that it may have some physiological significance.

To demonstrate the rete, which varies considerably in appearance at different stages of sexual maturity and under pathological conditions, serial sections of ovaries are necessary. The rete is found within the longitudinal axis of the hilus. It consists of groups of epithelial tubes and strands. In the fetus and the newborn infant and during the first years of life these epithelial ramifications usually do not possess any distinct lumen, although exceptionally they present minute spherical or oblong cysts. At the time of puberty the epithelial cells

change in appearance and the tubes show distinct lumina although their general arrangement and axial direction remain unchanged. The epithelial cells, which are sometimes cuboidal and sometimes cylindrical, have larger rounded or oval nuclei containing grains or filaments of chromatin and one or two nucleoli. The cytoplasm is granular, foamy, or vacuolar. During pregnancy and in certain pathological states (uterine fibroids) the rete increases greatly in size, its tubules being filled with secretion which distends their larger lumina. The secretion stains with mucicarmine. Occasionally the epithelium, which secretes mucus, shows papillary proliferations which occasionally invade the tubal lumina, producing a pseudo glomerular appearance. The blood supply is very rich, especially when the proliferation is most active.

Of especial interest in the rete is its innervation. The nerve supply of the ovary is arranged in three large horizontal plexuses or layers extending to the level of the cortex and sending out ascending vertical branches. The first large plexus leaving the hilus provides the nerve bundles which surround each tubule of the rete and form a secondary submucous plexus. These are divided by further extensions to the epithelium of the tubules to form a subepithelial plexus.

The rete communicates with the epoophoron at the cranial pole of the ovary. The author believes that it is derived from the wolffian body. It is the homologue of the rete testis in the male. Because of its rich nerve supply, Wallart believes it represents something more than a mere embryonic rest.

The wolffian body, which plays an important directive rôle in the organization of the gonad, is a segmented organ, various parts of which are responsible for different ovarian structures. The author's researches demonstrate a definite segmental arrangement of the ovary which is determined by the rete groupings as well as by the corresponding nerves. Histological examinations frequently show this segmentation when certain portions of sections are seen to be perfectly normal whereas adjacent areas present well defined sclerosis demarcated by the anatomical segments. This indicates that there is also a functional relationship between the rete and the nerves. The rete apparently exercises a trophic rôle in the economy of the ovary and probably also in that of the uterus. The author advances the hypothesis that the rete is one of the receptors or transformers of the "commands of the hypophysis upon the genital apparatus."

Wallart does not agree with those who claim that the rete and the wolffian body have no functions except those of excretory organs during embryonic life. On the basis of the recently acquired knowledge that other organs which lose their excretory ducts during embryonic life play important rôles in the post-embryonic period—the hypophysis, for example—he believes that the rete will eventually be proved a structure of great importance.

HAROLD C. MACK, M.D.



Maura, M.: A Contribution to the Study of Ectopia and Inguinal Hernia of the Ovary. Two Cases of Congenital Ectopia of the Ovary and Tube in the Labium Majus (Contributo allo studio della ectopia e dell'ernia inguinale dell'ovario. A proposito di due casi di ectopia congenita dell'ovulo della tromba nel grande labbro). *Arch d'ester* 1934, 4, 73

The author emphasizes that although hernia and ectopia of the ovary are often confused, there are distinct differences between them. The predisposing causes of ovarian hernia are persistence of Nuck's canal, the presence of an inguinal sac, unusual size of the fovea or canals of the abdominal wall, congenitally long ligaments, adhesion of the ovary to herniated mesentery or intestinal loop, and repeated increases of intra-abdominal pressure. Deformity or disease of the reproductive organs may or may not be present. About 95 per cent of ovarian hernia are inguinal, and congenital hernia of the ovary is much more frequent than ectopia. When the ovary alone is found in the labium, the condition is hernia and usually acquired.

Ectopia of the ovary is caused by a focal anomaly of the genital tract, a developmental abnormality of the müllerian ducts, or generally defective development of the internal genitalia. The descent of the ovary is stopped normally by fixation of the gonio-inguinal (round) ligament in the uterine horn. However if the ligament extends to the base of the labium majus and if Nuck's canal persists, the gonio-inguinal ligament may exert traction on the ovary and pull it into the labium. The ligament then atrophies and the ovary remains in the depths of Nuck's diverticulum, the upper part of which becomes partially or wholly obliterated. In short, the normal obstacle to descent being absent because of defective genital development, the ovary passes through the inguinal canal by the same mechanism as the testicle. Physiologically interpreted, ovarian ectopia is due to lack of the normal stimulus (possibly hormone) to the completely feminized genital development.

It is impossible to say how many cases of true ectopia of the ovary into the labium have been reported, but in general all simple congenital ovarian hernia accompanied by genital anomalies should be considered as inguinal ectopia of the ovary. These are not extremely rare. The important criteria are the presence of a true sac containing the ovary (although this is not mentioned in the literature) and persistence of Nuck's canal. The most common genital defects are absence and embryonic development of the uterus, and the next most common, female hermaphroditism and unicornate and bicornate uterus.

In connection with a review of the literature Maura discusses the pathology, differential diagnosis, complications, and treatment.

Both of the patients whose cases are reported by the author were forty-two years old. One of them had had six, and the other two, normal pregnancies.

The first patient had had a painful, irreducible swelling in the left labium for eight years. She was admitted to the hospital for an acute attack associated with an increase of the effing, severe pelvic pain, nausea, and obstipation which began three days previously at the menstrual period. At operation, a true hydrocele, the size of an egg, was found, the adnexa being embedded in the wall of the sac. A funiculus containing a duct resembling the vas deferens passed through the inguinal canal into the abdomen. The closed hydrocele sac was in loose distal contact with a peritoneal diverticulum which in turn constituted the sac of an external oblique hernia containing intestine.

The second patient was considered to have had an inguinal hernia since childhood and was admitted to the hospital during an acute attack similar to that of the first patient. The sac contained omentum in addition to the adnexa, and a structure suggesting the funiculus ran from the sac to the peritoneal cavity.

The article is illustrated and is followed by bibliography. M. E. Moxer, M.D.

Segurund, H.: The Resistance of the Ovary to Gonadotropic Hormones (Resistenza dei Ovarii agli ormoni gonadotropici). *Zentralbl f Gynak* 1934, 2, 343

The author investigated the resistance of the generative glands to the gonadotropic hormones by studies of women and experiments on animals. The resistance is shown by graded sensitiveness of the follicles to gonadotropic hormones and by the action of the sexual hormones formed in the mature follicles and the corpora lutea upon the endocrine system. Therefore it is not necessary to draw upon the new formation of follicles in the sexually mature ovary in animals to explain the resistance against gonadotropic hormones.

The potency of the gonadotropic hormones depends upon the state of maturity of the follicles. Primordial follicles of infantile ovaries do not react to gonadotropic hormones. Follicles of juvenile ovaries which already show tendency to form follicular fluid react to these hormones, and the more mature they are the more rapid and more physiological is their reaction. The primary follicles in the ovaries of mature animals are also invulnerable to the influence of gonadotropic hormones under physiological as well as pathological conditions. Of the follicles which come under the same hormonal influences simultaneously in the menstruating organism, the most mature react the most quickly and most strongly to the liberated impulses of the hypophysis, and through their hormonal action upon the endocrine system (especially the hypophysis) prevent, for the duration of their function, the maturation of the next groups of follicles.

This protective mechanism of the follicles shows not only that the primordial follicle is insensitive to gonadotropic hormones, but also that hormonal stimulation cannot be achieved by exhaustion of

that of the vagina) The lateral parametrial tissues and the round and infundibulopelvic ligaments are divided. The peritoneum is closed by a suture including the adnexal stumps The perineal wound is then sutured and the wound cavity tamponed After the operation from 2 to 3 roentgen treatments are given (FRIEDL) LOUIS NEUWELT, M D

### MISCELLANEOUS

Bishop, P M F, Cook, F, and Hampson, A C  
Indications for the Clinical Use of Progesterin  
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The rôle of progesterin in normal menstruation is to produce the progestational phase of the endometrium and inhibit the spontaneous activity and responsiveness of the uterine muscle to oxytocin from the posterior lobe of the pituitary) This rôle persists during the first three months of pregnancy

When progesterin is prematurely withdrawn during the menstrual cycle the uterine muscle undergoes violent and painful contractions giving rise to dysmenorrhœa The result of the withdrawal of progesterin during early pregnancy is habitual abortion due to the return of the uterine contractions and withdrawal of the stimulus to decidua proliferation Therefore, in both of these clinical conditions progesterin is indicated

In cases of menorrhagia and metrorrhagia in which no pathological condition is found in the cervix and the abnormal bleeding is considered due to inadequate stimulation of the ovary by the pituitary gland, progesterin is of value when administered with pituitary preparation When the deficiency of pituitary secretion is so great that the ovary fails to secrete sufficient œstrin or progesterin to stimulate the uterus, an infantile state of the pelvic structures results Clinically, the menses are scanty and infrequent and associated with dysmenorrhœa, or complete amenorrhœa occurs Functional sterility may also be present Large doses of œstrin are sometimes successful in developing the uterus to the adult size, and if they are followed by progesterin, menstruation may ensue

On the basis of these facts the authors suggest the following dosage

Habitual abortion One rabbit unit of progesterin given daily for two months, the treatment being begun a month before the usual time of abortion

Threatened abortion One rabbit unit of progesterin administered daily until the signs of threatened abortion, that is, bleeding and pain, have disappeared. Rest in bed is essential during this treatment.

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The authors admit the difficulty of evaluating the effect of progesterin in threatened and habitual abortion  
A F LASH, M D

Barringer, E D The Treatment of Gonorrhœa in the Female *J Am M Ass*, 1934, 103 1825

This article is based on the cases of thirty women with genital gonorrhœa who were treated with gradually increasing doses of vaccine, five who were treated with small doses of vaccine, and thirty who were given only routine treatment. The vaccine was prepared by the New York City Bureau of Laboratories from seven of the Torrey strains

The results, while not entirely conclusive, were sufficiently good to warrant further investigation The vaccine treatment seemed a valuable adjunct in the acute and subacute cases and also in the chronic cases without a "mixed" infection As the larger doses caused a considerable local and general reaction, the author questions the advisability of their use The general impression was that vaccine therapy in conjunction with routine treatment may shorten the period of hospitalization

HENRY S ACKEN, JR., M D

Abruzzese, G The Constitutional Predisposition to Tumors of the Genital Organs in the Female (La predisposizione costituzionale ai tumori degli organi genitali nella donna) *Riv ital di ginec*, 1934, Supp Vol 17

This article is based on a study of 219 females with extragenital tumors, 2,237 females with tumors of the genitalia, and 1,000 controls The patients with extragenital tumors were studied to determine the occurrence of multiple tumors in association with genital tumors All of the tumors were examined histologically The 2,237 tumors of the genitalia included 1,159 fibromata of the uterus, 297 simple ovarian cysts, 147 malignant ovarian tumors, 167 carcinomata and adenomata of the corpus uteri, 422 carcinomata of the cervix uteri, and 45 vulvovaginal carcinomata

Heredity was found to be an important factor in the development of tumors as a history of malig-

was very well supplied with vessels, particularly lymph vessels.

Because of its site, Willis concluded that the tumor had its origin in the connective tissue supporting Bartholin's gland.

(Schiller) JACOB E. KLEIN, M.D.

Scheufler, G. C., Duke, R., Crynes, E. F., and Scheufler, G. Infection of the Immature Vagina: Observations and Results. A Study of 189 Patients. *West. J. Surg. Obst. & Gynec.* 934, 4: 669.

Of the 89 cases of infection of the immature vagina reviewed in this article, 63 were private cases and 8 were dispensary cases. The authors state that although it was formerly believed that children with such infection should be hospitalized, many hospitals avoided taking them as they regarded it as too gross to group such children with children who were uninfected. Finally the conclusion was drawn that the dogmatic ruling in favor of hospitalization was fundamentally wrong.

The authors report the organization of an out-patient clinic for such children. Children who are court cases and those who cannot be satisfactorily managed in their own homes are committed to the care of foster mothers under very close supervision by social service and visiting nurse agencies. Thereby they are isolated from contact re-infection without hospitalization and are kept from being stigmatized in the community. They are scientifically treated and receive with kindly personal supervision in private homes.

The authors discuss chiefly a method of treatment devised on the basis of the suggestion of Gelborn and Stein. In this procedure anhydrous lanolin with a 1 per cent content of silver nitrate is introduced into the infected vagina under sufficient pressure to cause definite ballooning and thorough and prolonged application of the antiseptic.

Of the 89 cases reviewed, only 99 are discussed in detail. The 90 others are excluded from detailed discussion because the condition was not a true vaginitis, the patient was still under treatment when the report was written, the patient did not complete the treatment, failed to return for re-examination, or received other treatment, or the diagnosis was questionable.

Gonorrhea was demonstrated by positive smears in 55 per cent of the 99 cases and was believed by the authors to have been the cause of the condition in a large number of those in which the smears were questionable or negative. A cure was obtained in 41 (80.3 per cent) of 51 cases with positive smears, 36 (83.3 per cent) of 43 with suggestive smears, and 6 (87.5 per cent) of 6 with negative smears.

In the dispensary cases, in which the duration of treatment before pronouncement of cure was longer, the incidence of recurrence was lower and the incidence of cure was higher than in the private cases.

In the total number of cases the incidence of single recurrence or re-infection was 5 per cent.

It was found that children who have once suffered vaginal infection are much more apt to contract a subsequent infection. However the symptoms and active infection were relieved very much more easily and quickly in subsequent attacks than in the initial attack.

Factors favoring recurrence or re-infection include systemic infections, enervating and fatiguing activities, proctitis, pin worms, masturbation, pyelitis, and foreign bodies. True endocervicitis, Bartholinitis, and abscesses are seldom of importance in this respect. An examination for foreign bodies should be made in every case of suspected vaginal infection. The presence of foreign body is usually manifested by a serousanguineous discharge. Loss of blood is seldom noted in the usual vaginitis.

In smaller groups of cases various antiseptics are employed, but none as efficient as the authors' method. The use of suppositories containing pyrrhon in a gelatin base was found of value as an adjunct treatment. The application of cold quarts right with the official pyrrhon was beneficial. The authors are convinced that this is a valuable supplement to other methods of ambulatory treatment. In a small group of poorly selected cases the use of theobals as disappointing. Psychic trauma in the patients was due to morbid attitude on the part of the physician or the parents. The danger of psychic trauma increased with the approach of puberty.

ROBERT M. GALT, M.D.

Troph, J. The Treatment of Primary Cancer of the Vagina (Behandlung des primären Vaginalkrebses). *Klin. Woch. Gynak. & Gynak.* 934, 1: 83.

The author reports 6 cases of primary cancer of the vagina which were operated upon according to his technique. Two of the patients remained cured after 5½ years. Altogether 5 cases of primary cancer of the vagina are found among 63 cases of cancer of the cervix treated in the period from 1921 to 1933. The condition is extremely malignant. According to the reports in the old literature, an absolute cure is obtained in only from 6 to 8 per cent of the cases. The author gives brief review of the different operative methods and describes his own method. The latter is a combination and modification of the Cunio-Picot method and the Amreich method.

After an arch-shaped incision with the convex side anterior has been made in the perineum from one tuberculum to the other the vagina is dissected from the rectum, vaginal cuff is made, and the para-vaginal and parametrial tissues are dissected free. The posterior parametrial tissues and the rectum are then dissected, the cul-de-sac of Douglas is opened, and the transverse cardinal ligaments of the cervix and the uterine arteries are ligated and divided. The bladder and ureters are separated off, and the vesico-uterine space is opened (according to the advice of Stoeckel, the bladder is separated only slightly so that its contour is definitely elevated from

that of the vagina) The lateral parametrial tissues and the round and infundibulopelvic ligaments are divided The peritoneum is closed by a suture including the adnexal stumps The perineal wound is then sutured and the wound cavity tamponed After the operation from 2 to 3 roentgen treatments are given (FRIEDL) LOUIS NEUWELT, M D

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Functional menorrhagia Extract of the anterior lobe of the pituitary gland given by injection up to 500 rat units three times a week over a period of two months The course may be repeated after an interval of a month or two In the premenstrual phase and during the time of bleeding the extract should be given daily, together with 1 rabbit unit of progesterin

Dysmenorrhœa One rabbit unit of progesterin given as soon as the pain begins or a day or two previously, if possible, and continued until the period ceases

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Heredity was found to be an important factor in the development of tumors as a history of malig-

## INTERNATIONAL ABSTRACT OF SURGERY

nancy in other members of the family was 3 times as frequent in the cases of neoplasm as in the controls. Most commonly the history of malignancy was on the maternal side of the family. The hereditary tendency may be merely a general predisposition to tumor formation, but frequently is specific as to the site of the tumor. A histological specificity was noted except in the occurrence of fibromata. The coefficient of heredity was highest in cases of carcinoma of the ovary, a fact which may be related to the malignant transformation of benign cysts. It was noted also that in the cases in which heredity was a factor the tumors appeared earlier in life.

Tuberculois was rarely associated with carcinoma, but was found more often with simple cysts. Rheumatism, hepatic calculi and metabolic diseases were often associated with fibromata.

Carcinoma were most common in females of medium and quite normal development. Fibromata, in those of the type classed as mesolymphatic and cystic, in those of the tall, thin asthenic type. Not infrequently the onset of puberty was retarded in females who later developed fibromata, whereas the reverse seemed true in those who developed ovarian tumors. This observation suggests that the association of fibromata and sterility is not a local phenomenon, but likely to occur in a certain type of individual with utero-ovarian deficiency. Fibromata are often associated with underdevelopment of the secondary sex characteristics.

The author suggests that the frequent association of carcinoma of the ovary with sterility may be due to primary change in the ovary leading to imperfect ovogenesis.

Carcinoma of the body or the cervix of the uterus, especially the latter, is closely related to pregnancy and the lesions incident to labor. This relationship is due not so much to the local lesions as to changes in the hormonal state of the organism which accompany and follow pregnancy especially changes in the ovaries and hypophyses, both of which are stimulated and may remain hyperactive.

Lesions and scars of the vulva and vagina are of prime importance in the determination of the occurrence of tumors in these sites.

In the cases reviewed the author noted an unusual frequency of association of tumors of the vagina and uterus with tumors of the breast. A similar association was found between tumors of the ovary and breast. As there is no parallel frequency of occurrence of benign tumors in the vagina or uterus and breast, it is possible that the malignant tumors depend upon a common growth impulse in these organs due to a functional affinity of possibly hormonal origin.

In a study of the sympathetic nervous system the parasympathetic system seemed to be dominant especially in cases of fibroma, regardless of the location or size of the tumors, and to a lesser degree in cases of carcinoma. Dominance of the sympathetic nervous system was noted frequently in cases of cysts.

Alasal, L. The Retraction of the Fornix and the Left Parametrium in Hypoplasia of the Genitalia (La retrazione del fornice del parametrio sinistro nella ipoplasia della sfera genitale). *Arch. ginec.* 1934, 4, 53.

The author reports his observations in the cases of thirty-eight women of child bearing age. He found a marked resistance in the left fornix extending upward to involve the para-uterine connective tissue and an infantile uterus which frequently deviated toward the left.

In the older literature the condition was often described as chronic parametritis atrophicans. Kline attributes it to deficient ovarian function incident to diminution of the blood supply especially through the utero-ovarian vessels. Women with this condition are sterile. Histological examination reveals atrophy of the pelvic connective tissue on the left side.

ORANGE C. FRODA, M.D.

# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

Robinson, L., and Datnow, M. M. The Differential Diagnosis of Pregnancy *Lancet*, 1935, 228 1

The authors discuss the indications for the diagnosis of pregnancy from the personal, legal, social, and medical points of view. In discussing the methods of making the diagnosis they emphasize the importance of considering the clinical features in the interpretation of the results of the tests. They state that it is in the complicated cases in which organic disease is associated with the pregnancy that the greatest difficulties arise. The variability of the symptoms and signs is shown by tables.

The first test for pregnancy consisted in noting the effect of the woman's urine on barley and spelt. This test was recorded in Berol's papyrus dating back to 1350 B.C.

The most recent biological tests, such as the Aschheim-Zondek, Friedman, and Brouha tests, are described and discussed. The Liverpool Pregnancy Diagnosis Station uses the following method:

One-half cubic centimeter of early morning urine is injected into four immature female mice weighing between 7 and 12 gm. each. The injections are repeated twice daily until five have been given. From ninety-six to one hundred hours after the first injection the mice are killed and their genital organs examined.

The results are classified as simple positive, simple negative, and modified reactions. The simple positive reactions, which are typical ovarian and uterine changes, are due to the combined action of prolactin and oestrogen and indicate the presence of active chorionic elements in the patient's tissues. The simple negative reactions are obtained when both prolactin and oestrogen are absent from the test urine. The modified reactions are of two types. In the first type, the experimental animal shows distention of the uterus, but no change in the ovaries after the injection of the test fluid. According to the authors' experience, this reaction indicates the presence of only one hormone in excess in the test urine, namely, oestrogen. It occurs when the urine is obtained from women with threatened or incomplete abortion. In the second type of modified reaction there is hypertrophy of the walls of the uterus, but only partial activity (follicular distention but no hemorrhage or luteinization) in the ovaries. This reaction is due to the presence of one of the prolactins (and absence of oestrogen) in the test urine. It may be produced by the urine of women at the menopause, women with genital tumors, and women who have been subjected to castration.

In conclusion the authors emphasize that these tests are made to determine the absence or presence

of hormones and their results must be interpreted in the light of the clinical findings.

A. I. LASH, M.D.

Gregersen, N. F. On Ectopic Pregnancy. *Acta obst. et gynec. Scand.*, 1934, 14 346

The author reviews ninety-five cases of ectopic pregnancy which show that the condition occurs with equal frequency throughout the period of fertility.

Thirty of the women were nulliparæ and sixty-five were multiparæ. In the majority of the cases there was a period of secondary sterility.

Twenty-one of the women gave a history of salpingitis, four had been operated upon previously for ectopic pregnancy, and five had been operated upon for other conditions. Fifteen had never borne a child or had an abortion or suffered from any disease of the internal genital organs.

The general symptoms of ectopic pregnancy are described. Of twenty cases in which a diagnostic curettage was done, examination of the mucous membrane showed decidual changes in nine.

Of seven cases in which the Aschheim-Zondek test was carried out, it was positive in five. In the two cases in which it was negative, tubes containing a dead embryo were removed. It is evident, therefore, that this test is a valuable adjunct in the diagnosis.

Of twenty-two cases in which the gonococcus complement fixation test was carried out, it was found slightly positive in four.

In all of the cases the treatment was operative removal of the ectopic pregnancy.

The findings of pathological examination confirmed the opinion that the cause of the retention and implantation in the tube is to be sought neither exclusively nor as often as is believed by many in an earlier salpingitis, but rather in ability of the tube to produce decidual changes, endometriosis of the tube, or congenital malformations. Moreover, in a number of the cases the inflammatory changes in the wall of the tubes were of such a nature that they could well be considered secondary to the presence of the ovum.

The author believes that the transfusions of blood given in some of the cases—most of which were auto-transfusions—were responsible to a great extent for limitation of the mortality to 2 per cent. This opinion is supported by the comparatively short time the twenty-two patients treated by transfusion were confined to bed. In these twenty-two grave cases with profuse hemorrhage recovery resulted in a shorter time than in the remaining sixty-three cases in which no transfusions were given, the average number of days required for recovery in the two

## INTERNATIONAL ABSTRACT OF SURGERY

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Triflat, P.: Autogenous Vaccines in the Treatment  
of Pyelonephritis of Pregnancy (Les vaccins  
autogènes G) 4: 404 1944, 30 407

Because of the wide differences of opinion regard  
ing the value, technique of administration, and  
mode of action of vaccines in pyelitis of pregnancy  
the author reports his experience in the treatment  
of twenty-eight cases of pyelonephritis of preg  
nancy. These cases, all of moderate severity, were  
proved to be resistant to ordinary medical methods  
of treatment (diet, urinary antiseptics) before the  
vaccinotherapy was instituted.

Two forms of vaccines have been advocated,  
named: stock vaccines and autogenous vaccines.  
Some believe that they exert their effect chiefly by  
causing protein shock, whereas others believe that  
at least the autogenous vaccines produce specific  
immunization, particularly in colon-bacillus infec  
tions. Couvreur considers all vaccines dangerous  
except in doses which are obviously ineffective. To  
avoid the dangers of the subcutaneous administration  
of vaccine, Brindley and Reglade administered  
enterovaccine by mouth. In eleven cases the re  
sults were excellent. Manik claims that the use of  
of vaccine therapy is of value. The use of the  
dead bacilli bacteriophage and Vincent's serum has  
been equally disappointing.

The author employs an autogenous colon bacillus  
vaccine which he prepares according to the method  
of Lebert within 4-5 hours after obtaining the  
urine specimen. The vaccine is made up in a 5-cm.  
ampoule containing from 10 to 4 billion organisms  
per cubic centimeter. Beginning with  
3 c.c.m. administered subcutaneously Triflat re  
peats the injections at 10-day intervals, increasing  
the dose 0.5 c.c.m. each time until 10 c.c.m.  
is reached. This routine is varied according to the  
progress of the infection and the patient's condition.  
The treatment should be begun early in the course  
of the disease and, to prevent recurrences, should be  
continued even after subsidence of the fever.

The majority of the author's cases (seventeen)  
were pure colon bacillus infections. With one excep  
tion, all responded to treatment with autogenous  
vaccine. One case of enterococcus infection was also  
treated successfully. In the remaining cases the  
infection was due to mixture of various types of  
colon bacilli and streptococci, two cases colon  
and pseudo-diphtheroid bacilli, one case and colon  
by nephrolithiasis, the therapeutic result was excel  
lent. A patient with infection due to colon bacilli,  
pseudo-diphtheroid bacilli, and enterococci suc  
ceeded to bronchopneumonia.

None of the dangerous symptoms feared by some  
were noted although in most cases there was a

febrile reaction after the injection. The most severe  
reactions were noted after the administration of the  
smallest doses of vaccine.

In five cases the vaccine was  
excellent. In seventeen it was only satisfactory.  
Three patients could not be traced subsequently and  
three were not benefited. If among the three  
cases in which the treatment was not beneficial  
there was one death from septicemia and the case  
with associated nephrolithiasis in which nephrec  
tomy became necessary later. In no case was inter  
ruption of the pregnancy necessary even though  
five of the cases were of the toxic type. The urine  
contained albumin in fourteen cases and albumin  
and blood in one case. After completion of the  
vaccine therapy the albuminuria persisted in only  
two cases. Postpartum fever occurred in only one  
treated case but in three of the cases which were  
not treated.

The beneficial effect of autogenous vaccine therapy  
is usually noted between the third and sixth injec  
tions. Relief of pain occurs first and is followed next  
by a drop in the temperature. The pyuria then  
comes although the bacteriuria may persist for  
some time. The same sequence has been noted  
after several catheterizations.

The author concludes that autogenous vaccine  
therapy is sufficiently satisfactory form of treat  
ment in pyelonephritis to arrest its routine use  
if it is free from danger. The sole contraindication  
is blockage of the renal pelvis, in which condition  
only urological treatment can be effective.

Blanco C. Mack, M.D.

Cassell, N.: Determination of Liver Function &  
the Toxicities of Pregnancy by the Hemo  
clastic Reaction of Jaundice (La réaction h  
ophtic du toxisme gravidique aiguë ou ch  
ronique 934, 7 903)

The author reports studies of the liver function of  
100 pregnant women made with modifica  
tions of the Jaundice technique which consists essen  
tially of recording the leucocytic response to ac  
tivated liver extract (hepatol or caspapol) intrave  
nously. Ten of the women subjected to the  
test were normal women in various stages of preg  
nancy, three had simple albuminuria, six had pre  
eclampsia, and seven had eclampsia.

In the cases of the normal women and those with  
simple albuminuria the test was negative, whereas  
in the cases of those with pre-eclampsia the majority  
of the tests were positive and in the cases of those  
with eclampsia all of the tests were strongly positive.

The author concludes that there is no liver damage  
in normal pregnancy or pregnancy complicated by  
simple albuminuria, but that in eclampsia and pre  
eclampsia there is marked liver damage.  
He states that the test described is simple and  
rapid and of prognostic value in the various forms  
of toxemia of pregnancy with or without hepatic  
involvement.

George C. Proctor, M.D.





fifteen minutes. On the other hand, in thirty-one cases of atonic bleeding following expulsion of the placenta, good results were obtained from the intra-muscular injection of 0.5 cc (1 mgm) of ergotamine tartrate and massage in from three to eight minutes. Hot uterine irrigations were necessary in only four cases. In seven cases vomiting occurred from one to two hours after the injection. Of forty-eight cases in which only  $\frac{1}{2}$  mgm of ergotamine tartrate was given intramuscularly the results were unsatisfactory and it was necessary to resort to other procedures such as the administration of pituitrin, hot irrigations, and tamponade in nine. In one case, in which the  $\frac{1}{2}$ -mgm dose was repeated, the hemorrhage stopped, but vomiting occurred.

In lochiometra, the administration of ergotamine tartrate by injection in the form of ergonov or by mouth in daily dose of mgm for one week yielded good results. In spite of the unfavorable results obtained by Bowring, Koerting, Terold, Schrammel, and Schultze with preparations of secale cornutum during labor the authors attempted to employ ergonov to improve labor pains on the basis of the good results obtained with this preparation by Herd, Weinheimer, Uter and others.

In preliminary tests made in five cases of dead fetus it was found impossible to induce labor by 0.5 injections of  $\frac{1}{2}$  mgm at intervals of one and one-half hours, and in two by three injections of  $\frac{1}{2}$  mgm at half-hour intervals. Following these tests, twenty-two women with premature rupture of the membranes, fifteen of whom were in the stage of dilatation, were given from one to four injections of  $\frac{1}{2}$  mgm at half-hour intervals, and after a period of latency of from fifteen to twenty minutes a good effect on the contractions of the uterus was observed. The use of forceps became necessary in only two cases and then not until several hours after the injection. One of these cases required high forceps. In the case of a para there was noted, after the third injection, a transitory disturbance of the heart tones of the child which coincided with vomiting of the mother. After forceps delivery the child developed tetanic spasms of the lower limbs and died of pneumonia and cerebral hematoma thirty-one hours later. Another child was born spontaneously in severe asphyxia as the result of powerful tetanic expulsive pains and could not be revived. Because of the tonic phenomena, the authors believe that in the first case death was caused by direct toxic injury to the circulation of the fetus.

After the third injection of  $\frac{1}{2}$  mgm at half-hour intervals there was often an accumulation of toxin which was manifested by vomiting. No other toxic phenomena were observed in the mother. Even when the dosage was given for considerable period of time ( $\frac{1}{2}$  mgm daily for seven days) there were no prodromal symptoms of gangrene. The authors believe that, in addition to the direct toxic injury of the vessel walls described by Guggenberger, an infectious toxic factor is necessary to bring on this condition. A transient increase in the blood pres-

sure of from 20 to 35 mm. Hg was first observed after  $\frac{1}{2}$  mgm had been given intramuscularly. After this dose, no change was observed in the blood picture. (Puzzo) JOHN W. BROWN, M.D.

Kottmeier H. L.: The Results Obtained With Thyrophysin in Cases of Weak Labor Pains (Resultats mit Thyrophysin bei Wehen-schwäche). *Acta Obst. et Gynec. Scand.* 1934, 14, 351.

After a brief critical review of the literature on thyrophysin, the author reports the results obtained with this substance in 165 cases of primary and secondary uterine inertia on the scores of Ahlstrom at Almlunda Barnbldskmet. The mortality and morbidity in 850 cases of primary and secondary uterine inertia in which no labor-inducing drug was given. This comparison shows that the use of thyrophysin considerably improved the prognosis for the mother and child and decreased the number of dangerous obstetrical interventions. On the other hand, the author calls attention to the fact that thyrophysin may cause asphyxia that occasionally its injection is followed by spasm, and that different women react differently to the same dose. Because of these facts he emphasizes that thyrophysin should be given only in cases of uterine inertia and at first in a dose of less than  $\frac{1}{2}$  c.c. a amount which apparently is associated with slight danger.

Contra-indications to the use of thyrophysin are contracted pelvis, transverse position and incorrect presentation of the fetus, and renal and cardiac disease of the mother.

In studies of the blood pressure made during and between the pains in the periods of dilatation and expulsion in the cases of women treated with thyrophysin the author found no appreciable increase as compared with cases in which thyrophysin was not administered. Therefore the use of thyrophysin is not contra-indicated in the presence of a moderate increase in the blood pressure.

Thyrophysin was not effective in exhausted patients or in the prelabor period. It was without apparent effect also in from 10 to 15 per cent of the reviewed cases in which the mother, as thoroughly rested and labor had begun. Possibly this lack of effect was due to the fact that the mother was in labor for a long time before the injection was given. The results are apparently better when the thyrophysin is given at a relatively early stage of inertia.

Leoni, J.: Delayed Rupture of the Bag of Waters Certain Reflections Concerning the Hypothesis of Kreis (Rapport retardé de la poche des eaux). *Quelques réflexions à propos des hypothèses de Kreis.* *Gynec. et Obst.* 1934, 30, 159.

It is well known fact that during labor the presenting part, even in the absence of pelvic obstacles, may fail to descend and the bag of waters remain unruptured despite advanced or complete dilatation

of the cervix. The author takes exception to the recent explanations of this phenomenon offered by Kreis and the Strasbourg school, namely, that the bag of waters retards rather than promotes the progress of labor. He bases his remarks on a case observed by him in which the fetal head, after having been deeply engaged, returned to the superior strait.

The author lists numerous factors which determine the time of rupture of the membranes. The chief factors are mechanical, i.e., they depend upon the relationship between the intra amniotic pressure during uterine contraction and the elasticity of the membranes during their distention. During the period of dilatation, rupture of the membranes is prevented by a regulatory mechanism in that, as the intra-ovular pressure increases, the distensibility of the bag of waters is increased by progressive separation of the membranes from the uterus which results in an increase of volume and at the same time a diminution of the internal pressure. Theoretically, late rupture of the membranes may be due to (1) insufficiency of the uterine contractions, (2) oligohydramnios, (3) sealing of the bag of waters by the presenting part during contractions, (4) extensive separation of the membranes from the uterus, and (5) diminished resistance of the lower uterine segment.

While in exceptional cases rupture of the membranes may be prevented by greatly thickened and toughened membranes (pathological), early rupture or late rupture does not necessarily imply variations in their structure. Mechanical factors must be sought for, chiefly factors concerned with the state of the lower uterine segment such as were present in the case cited by the author.

By means of an instrument devised by him and shown by an illustration included in the article, Leon attempted to reproduce the conditions present in the parturient uterus. From his findings he concludes that transverse expansion of the lower uterine segment (without marked elevation of the contraction ring) explains why the bag of waters does not rupture even though the membranes are not unusually resistant. It explains also why the presenting part does not engage when it remains elevated and why it may rise again after having been engaged. The bag fails to rupture because the intra-amniotic pressure is lowered (provided, of course, the membranes are sufficiently distensible). The head fails to descend because, after they give way, the walls of the lower uterine segment no longer have a tendency to constrict and the fetal head no longer has a tendency to engage itself through flexion. If the head has already penetrated the pelvis its "potential energy" tends to carry it to the superior strait in an indifferent attitude. Knowledge concerning the physiology of the parturient uterus and the properties of the membranes proves that relaxation of the lower uterine segment is due, not to excessive pressure of its contents (ovular theory), but rather to the diminished resistance of its walls

(segmentary theory). This, in turn, is the result of inhibition or active decontraction of the circular fibers or the altered state of the tissues (fatty or hyaline degeneration of the musculature, alterations of the elastic elements) which causes them to give way readily. The author designates it as "the syndrome of giving way of the lower uterine segment at the end of the period of dilatation in the presence of normal uterine contractions." He suggests this special designation to emphasize the theory of pathogenesis which he considers most plausible and to distinguish the condition from other secondary dynamic insufficiencies in cephalic engagement and uterine dystocia which are also characterized by transverse expansion of the lower uterine segment but in which there is concomitant tetany or retraction of the fundus.

HAROLD C. MACK, M.D.

Burns, J. W. Breech. A Method of Dealing with the Aftercoming Head. *J. Obst. & Gynaec. Brit. Emp.*, 1934, 41: 923.

The author presents a method of dealing with the aftercoming head which he believes permits the head to follow the normal course of delivery and prevents the application of undue force to the child. The method is as follows:

After delivery of the arms and shoulders the child's body is allowed to hang from the vulva. This produces flexion of the head and brings the nape of the neck well into the subpubic angle. In most instances it brings the head through the brim with minimal force and traction. If the weight of the child's body alone is not sufficient to accomplish this, suprapubic pressure may be exerted by the obstetrician. When the head is in the pelvis the obstetrician stands sideways to the buttocks and, using the hand farther away from the patient, grasps the ankles of the child in their most dependent posi-

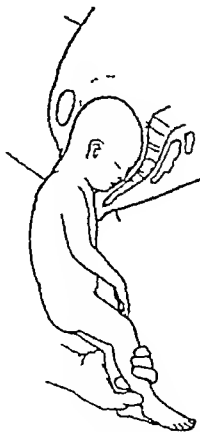


Fig. 1. The position of the infant at the moment the grip is first applied and traction is exerted.



Fig. Completion of delivery

tion and applies tension outward and upward, rotating the child and at the same time extracting it. The force of extraction which can be employed is relatively slight, but must be maintained for the use of an upward force alone will result in serious injury to the child. Burns emphasizes that haste is unnecessary in delivery of the breech presentation.

HENRY S. ACOSS, JR. M.D.

#### MISCELLANEOUS

Confantini, M.: The Behavior of the Blood Sugar After Injections of Placental Extracts (Il comportamento del tasso glicemico in seguito ad iniezione di estratti placentari). *Riv. ital. di ginec.* 1934, 7, 8.

Since the discovery of insulin and recognition of the fact that other substances also may produce hypoglycemia, various extracts of the placenta have been studied to determine the relationship of the placenta to carbohydrate metabolism. The many researches reported in the literature are reviewed.

The author made a series of experiments in which placental extracts were introduced into animals by various routes and the blood-sugar levels then determined. He found that the injection of placental extracts in general produced a constant hyperglycemia and prolongation of the curve of alimentary glycemia. The results were similar whether the extracts were introduced subcutaneously intravenously or intraperitoneally and whether they were obtained from human beings or animals. The injection of similar doses of various proteins for control produced analogous but less marked changes.

On the basis of these results the author concludes that extracts of the placenta exert specific but only a moderate influence on the blood sugar level.

A. LOREN ROSE, M.D.

# GENITO-URINARY SURGERY

## ADRENAL, KIDNEY, AND URETER

Goldzieher, M, and Koster, H Adrenal Cortical Hyperfunction *Am J Surg*, 1935, 27 93

Five cases of hyperfunction of the adrenal cortex treated by unilateral adrenalectomy are reported. Four of the patients were benefited and one died. Histological examination revealed a pathognomonic alteration of the reticular zone. Enlargement of the adrenal gland was not equally conspicuous in all cases. Storage of lipoids in the external layers was always evident but did not differ materially from that occurring in cases of adrenal lipoidosis without the clinical symptoms described. In all five cases, microscopic study showed the hitherto unrecognized formation of an unusually broad reticular layer in the cortex. The authors do not recall having seen comparable cortical changes in any other condition.

The tripartite syndrome includes hirsutism, obesity, and menstrual disorders. Three glands can be brought into causal relationship to it: the pituitary, the ovary, and the adrenal. In an analysis of the glandular factors responsible, the authors point out differences in the symptoms. They state that the differential diagnosis of the underlying morbid changes requires both positive and negative findings—negative findings as regards two glands and positive findings as regards one gland.

When the ovary is responsible, the cause is probably an ovarian neoplasm. Gynecological examination usually reveals the presence of such a growth. If an ovarian tumor is palpated in a patient with hirsutism, generalized obesity, amenorrhœa, or metrorrhagia, the diagnosis is rendered certain. In the presence of virilism with a large clitoris, a husky voice, and atrophy of the breasts, the diagnosis of ovarian arrhenoblastoma may be made. If bimanual palpation is unsatisfactory for any reason, other causes must be excluded.

In examination of the pituitary greater difficulties are encountered. Roentgenography of the sella turcica and studies of the eyegrounds and visual fields yield excellent presumptive evidence if they are positive. However, negative findings are obtained in cases of small tumors (basophilic adenomata). Disturbance of carbohydrate metabolism suggests pituitary disease. A high sugar tolerance and a tendency toward hypoglycæmia accompany hypofunction and a decreased sugar tolerance and hyperglycæmia are usually associated with hyperfunction of the anterior lobe of the pituitary gland. Chemical study of the blood may disclose a high uric acid content. Disturbances of chloride metabolism combined with either oliguria or polyuria are indicative of a posterior lobe affection. Frequently an affection of the posterior lobe is associated with

an affection of the anterior lobe. Disturbances of sodium chloride metabolism are revealed by a sodium chloride tolerance test.

Determination of the basal metabolism yields little or no information, but the specific dynamic action of proteins is of greater significance in pituitary disease if a small protein test meal is used. The specific dynamic action is low in hypopituitarism. In cases of tumor it is normal or elevated. Another diagnostic aid is the fat-tolerance test. If fat is fed to a normal or obese individual the acetone-body content of the blood rises. In pituitary obesity there is no such rise. Pituitary disease may be revealed also by skeletal measurements, the facies, the appearance of the skin and teeth, and the distribution of pigment. Conclusive evidence of pituitary hyperfunction is the demonstration of pituitary hormones in the blood or urine. In the immature mouse, a positive reaction is shown by maturation of the ovarian follicles.

Exclusion of the ovary and pituitary as the sites of the lesion points to the adrenal cortex as the cause. Bilateral diffuse hyperplasia of the cortex or a tumor can be differentiated only by inspection. Marked virilism is more likely to be the manifestation of a neoplasm and obesity a manifestation of hyperplasia. The demonstration of the cortical hormone in the urine has not yielded unequivocal results. Thus far, a substance showing physicochemical properties similar to those of interrenin has been isolated.

LOUIS NEUWELT, M D

Geschickter, C F Suprarenal Tumors *Am J Cancer*, 1935, 23 104

The author reports 105 primary tumors of the suprarenal gland. Among them were 66 benign and 6 malignant tumors of the cortex. Of the benign tumors of the cortex, 63 were found at autopsy and had been asymptomatic. The principal signs of the 3 others were sexual precocity, hypertension, and a mass. Those of the malignant type without symptoms of excess suprarenal secretion were associated with obesity, hypertension, and a mass. In the cases of symptomatic tumors, virilism, hirsutism, and hypoglycæmia were found.

Malignant tumors of the cortex of the suprarenal are rare. They are accompanied by pronounced endocrine disturbances. Children with such tumors show sexual precocity, whereas adults show marked sexual inversion. Females are more affected than males. In children, skeletal changes, disturbances of sugar metabolism, polycythæmia, and mental retardation are frequent, and in adults, psychic disturbances are common. The pituitary sex hormone, female sex hormone, and Prolan A may be present in the urine.

To explain the sexual changes the following theories have been advanced.

The adrenal cells of the tumor act indirectly on the gonads.

2. The changes are produced by the adrenal cells which retain their primitive sex functions.

3. The adrenal cells stimulate the anterior lobe of the pituitary which in turn acts on the gonads.

The evidence favors the latter two theories.

The medullary tumors apparently arise from a single stem cell which is separated from the neural crest early in embryonic life. They may be very malignant or benign. Of 55 such tumors reported, 35 were neuroblastomata. Seventeen of the latter occurred in children and 4 in adults. In structure, the neuroblastoma resembles the sympathetic tumor occurring in the outlying vertebral ganglia and the retinoblastoma and the medulloblastoma of the cerebellum occurring in children. It is very small.

In the cases of suprarenal tumor in children the most common manifestations were an abdominal mass, pain, vomiting, and emaciation. Fever, exophthalmos, and joint pain may also occur. Pepper emphasized the early onset at which the tumors appear, their rapidity of course, and the associated enlargement of the liver a short while or months. Hutchinson described metastases to the skull. In the adult, the first symptoms may be due to vertebral metastases. Of the author's cases, adeno was found at autopsy in 2. Metastases to the long bones, spine, or pelvis may occur before involvement of the skull. Involvement of the lungs and mediastinum is rare.

The tumors are not radioresistant. One surgical cure has been reported.

Among the neoplasms reported by the author were 8 paragangliomata which were equally divided into benign and malignant groups. Such neoplasms may be associated with hypertension, hypotension, vasomotor instability, Addison syndrome, multiple neurofibromatosis, glycosuria, or hyperthyroidism. They rarely reach large size. The larger tumors are often cystic.

The tumors reviewed included ganglioneuroma and chromaffin tumor. These neoplasms are very rare. The ganglioneuroma is the most highly differentiated neurogenic tumor and the chromaffinoma the most highly developed endocrine tumor of the medulla. Malignant and benign varieties of each have been reported. CLAUDE D. PICKERSILL, M.D.

Reiner J. and Leriche, R. The Clinical Aspects and Treatment of Paraganglioma. *Ullrich-Festschrift Grosse of Suprarenal Origin (Zur Klinik und Therapie des Paraganglioms. Adrenochrome Hochdruckkrankheit)*. *Ann. Klin. Wochenschr.* 1934. 24.

Since the days of Pail,pressor vascular crises have been understood to be transitory (attacks of increased blood pressure which in most cases are due to central or reflex blood pressure crises). These high blood pressure crises belong also distinct

form which is independent of the aforementioned etiological factors and is classified by Bernal as being anatomically similar to surrenoic or adreno-surrenoic hypertension.

The authors report a case of the latter type in which the attacks occurred in a forty year old man who had previously been healthy. The attacks always occurred in the same manner, being accompanied by a feeling of emptiness in the epigastrium, nausea, facial pallor, pallor of the extremities which felt cold to the touch, palpitation of the heart, shivering, sweating, and feeling of pulsation in the eyeballs. They lasted for from one-half hour to one and one-half hours, and occurred daily with absolute regularity. They could not be influenced in any way by drugs. During rest the blood pressure varied from 160 to 180 mm. Hg. During an attack it rose to 245 mm. Hg. A diagnosis of essential high pressure of suprarenal origin was made.

After finding in the literature the reports of more than six similar cases which were operated upon successfully, the authors explored the right kidney in their case. However, nothing abnormal was found. At later exposure of the left kidney a smooth encapsulated tumor the size of cherry, as found attached to the lower pole of the left suprarenal gland. Since the removal of this tumor the attacks have not recurred. Histological examination of the neoplasm revealed the typical signs of a paraganglioma. When such a condition is assumed after all diagnostic aids have been exhausted, extirpation of the tumor is the only therapeutic measure to be considered. Extirpation of the suprarenal gland should not be done.

Attention is called to the fact that in the case reported the pulse rate was either normal or definitely reduced during the high-pressure crises. The authors are unable to offer an explanation. They believe that in this form of high-pressure bradycardia the great increase in the arterial pressure during the attack undoubtedly results in increased irritation of the pressor-receptor nerve areas in the carotid sinus and the arch of the aorta which would necessarily produce a reflex bradycardia. The bradycardia proves also that there is no vascular sclerosis in cases of this type.

(P. SCHWENK, PHARMACEUT.) MATTHEW J. SHEPARD, M.D.

Fritzen, M. G.: The Internal Topography of the Arterial System of the Kidney and Renal Pelvis of Human Being and Domestic Animals. *Monograph Anatomical Studies (Intern. Topographie des arteriellen Systems der Niere und des Nierenbeckens des Menschen und der Haustiere. Reizphysiologische Untersuchungen)*. *Zentralbl. f. Anat. u. Chir.* 1934. 40.

Following review of the literature the author first describes the method used by him in the study of the internal topography of the arterial system of the kidney and renal pelvis. After careful dissection, the freshly removed kidney of a human being, dog, cat, or rabbit is filled by the injection into the ureter of contrast medium (a mixture of Ethargy,

plaster of Paris, and water) and studied roentgenographically. To study the vascular system of the kidney, a mixture of litharge, white lead, or lead oxide in vaseline or oil of turpentine is injected into the vessels through a cannula. Dorsoventral, lateral, and stereoscopic roentgenograms are then made. In addition, a combined method is used to obtain simultaneous views of the vessels and renal pelvis.

In studies of 432 kidneys (among which were 119 human specimens), 942 roentgenograms were taken. From the findings the author draws the following conclusions:

Comparison of the renal pelvis of man and domestic animals showed a similarity between the renal pelvis of man and the pig on the one hand and between the renal pelvis of the dog, cat, sheep, and rabbit on the other. On the basis of form and development the following 4 types of renal pelvis are recognized in man and domestic animals: (1) a dichotomous branching of the ureter in the kidneys of large ruminants such as the cow and ox (ramification ureters), (2) a 2-horned renal pelvis in the monopapillary kidney of the horse (pelvis bicornis), (3) a renal pelvis with leaf-shaped branchings in smooth kidneys with complicated papillae (cat, dog, rabbit, sheep), and (4) a renal pelvis with true calyces in multipapillary kidneys of the human being and swine (omnivora). The extrarenal type of renal pelvis is more constant in the adult and the intrarenal type more constant in the newborn. Ivanitzski's classification of renal pelvises into the embryonic, animal, and human types has been proved inaccurate. Kuprianow's division of the arterial system of the kidney and renal pelvis of man into a complete and an incomplete type is not correct from either the theoretical or the factual standpoint. On the basis of phylogenesis and ontogenesis as well as the anatomy at different age periods it is more correct to distinguish the following 4 types: (1) the early embryonal, (2) the late embryonal or fetal, (3) the adult or mature type, and (4) the infantile type. In the lower animals as well as in man the branching of the renal arteries is not uniform. There are 4 types: (1) the first magistral type, which occurs chiefly in the large ruminants, (2) the second magistral type, which occurs in the horse, (3) the scattered type, which occurs chiefly in kidneys with a leaf-shaped pelvis, and (4) the bifurcation type, which occurs chiefly in omnivora. Between these types there are transitional forms. The branching of the arterial tree in the kidney is related to the structure of the kidney as a whole and the renal pelvis. The relation between the arterial system of the kidney and the renal pelvis is so constant that in the lower animals it is possible to determine the form of the renal pelvis from the character of the vascular tree as shown in the roentgenogram and vice versa. In the cases of human beings it is possible to determine the type of distribution of the renal arteries with considerable accuracy from the shape of the renal pelvis as

demonstrated by pyelography and the number, direction, and position of the interlobular vessels from the character of the calyces.

Pyelovenous backflow is due, not only to simple mechanical stretching and tearing of the renal pelvis, but also to the anatomical structure of the organ.

In conclusion the author says that roentgenological examination supplementing the corrosion technique is of great value in the study of the internal topography of the kidney. Because of its special clarity it should be employed in the study not only of human anatomy but also in that of the lower animals for which it has been seldom used heretofore. (COLMERS) JACOB E. KLEIN, M.D.

Noszkay, A. von. The Value of Decapsulation in Cases of Medical and Surgical Nephritis. (Der Wert der Dekapsulation in Fällen von interstitischen und chirurgischen Nephritiden). *Ztschr. f. urol. Chir.*, 1934, 40: 107.

Von Noszkay discusses the value of decapsulation of the basis of twelve case histories and draws the following conclusions:

The surgical treatment of non-suppurative and suppurative kidney inflammations has two aims: (1) to arrest the inflammatory process and thus prevent further destruction of the parenchyma, and (2) to increase the more or less decreased function of the kidney as much as possible. The procedure best meeting the requirements is renal decapsulation by which the kidney attains conditions favorable for healing. While the favorable conditions usually last for only a few weeks or months, this length of time may be sufficient to arrest the inflammatory process in the kidney or even to bring about complete healing.

The effect of decapsulation may be attributed to the following factors: (1) removal of the capsular tension, (2) the sympathectomy action of the capsular resection and the relief of the angiospasm with a resulting increase of diuresis and cessation of the kidney pains, and (3) the removal of the infectious and toxic tissue secretions by drainage of the intraparenchymal tissue spaces.

In non-suppurative nephritis the disease involves chiefly the parenchyma whereas in suppurative nephritis it involves chiefly the interstitial tissues. Therefore the indication for decapsulation is quite different in medical and surgical nephritis. Von Noszkay states that bilateral hematogenic non-suppurative nephritis is basically a medical condition, but there are mixed forms in which medical treatment is greatly helped by decapsulation. In the surgical treatment it must be borne in mind that the sites of origin of the infection (tonsils, teeth, appendix) should always be cleaned up or removed first.

In acute glomerulonephritis decapsulation can be recommended only in cases of severe oliguria or anuria. When acute glomerulonephritis fails to become cured or progresses under medical treatment,

bilateral decapsulation performed as soon as possible is to be recommended to prevent the condition from becoming chronic. It is especially in such cases, the subject of so much controversy, that a favorable result may be expected from the operation.

In chronic glomerulonephritis and secondary adrenergic kidney long-continued improvement cannot be expected from decapsulation even though it may relieve oliguria or anuria for a short time. Therefore in these conditions the operation is not indicated.

Most types of hemorrhagic nephritis should be classed with acute or chronic glomerulonephritis. The bleeding can usually be stopped by decapsulation, but recurrences are not uncommon. Both types of suppurative nephritis are purely surgical diseases. In many cases cure results following internal local (instrumental) treatment. When the process progresses, decapsulation should be done as early as possible. It may be supplemented by nephropexy or in cases of urinary stasis, by transurethral drainage. Nephrectomy should be performed in only the most extreme cases.

In chronic pyelonephritis, pyelonephritic sclerotic kidney, successful result from decapsulation can be expected only when a sufficient amount of functioning parenchyma remains. Under the latter circumstances the condition being an infectious disease of the parenchyma, a more successful result can be expected from the operation than in cases of non-suppurative sclerotic kidney.

In conclusion the author says that while decapsulation has proved to be a valuable procedure in conservative surgery of the kidney, careful consideration of its indications is essential for good results. (Cologne) HARRY A. SALZ, M.D.

Conington, R. E. The Treatment of Bilateral Renal and Ureteral Calculi. *J. Urol.* 1934, 33: 800.

In cases of bilateral renal and ureteral calculi the doctor prefers, when surgery is indicated, to attack the more involved kidney first. It justifies this procedure by his own results and those obtained by others. He concludes, however, that no one procedure is applicable to all cases. Following discussion of the usual method of operating first on the kidney with the better function, he considers the various aspects of pyelotomy, nephrostomy, nephrouremy, nephrectomy and conservative procedures in cases of stone and measures for the prevention of stone formation. (Gruney) J. THOMAS, M.D.

Wharton, L. R. Pre-Operative Irradiation of Malignant Tumors of the Kidney. A Clinical and Pathological Study. *Arch. Surg.* 1935, 30: 35.

The results of operation in cases of kidney tumors have been unsatisfactory. The data collected by the author showed that metastases are present in from 10 to 20 per cent of the cases. In from 10 to 20 per cent only an exploratory operation as performed without due to operative shock occurred. In from 5

to 30 per cent, and cure resulted in fewer than 1 per cent. Most of the poor results were due to the large size of the tumor and difficulty in its removal by the usual lumbar incision.

The seven cases reported by Wharton are divided into three groups. In Group 1 are two cases of massive tumor operated upon without previous irradiation. In the first case in this group the tumor was removed through a transperitoneal incision. Death occurred from shock three hours later. In the second case an exploratory operation and biopsy had been done previously by another surgeon. Because of multiple implantations in the wound, peritoneum, and lumbar forams, operation was not advised. The size of the tumor was reduced 90 per cent by irradiation.

In Group 2 are three cases in which a small tumor was removed after preliminary irradiation. In the first case, biopsy had been done. Because of adhesions, the prognosis was not very favorable. In the second case the tumor was a hypernephroma of the suprarenal gland of the Grawitz type. The kidney was normal. In the third case the neoplasm was a Wilms tumor. In all of these cases there was a marked reduction in the size of the tumor following irradiation.

In Group 3 were two cases of tumor so small that pre-operative irradiation was not necessary.

In conclusion Wharton says that pre-operative irradiation results in hyalinization, pyknosis, fragmentation, and partial destruction of the malignant tumor and a remarkable decrease in the size of the tumor. Irradiation is a valuable means of preparing for operation, but does not cure.

The (transperitoneal) approach prevents trauma to the tumor before the vessels are ligated and is the most logical, clear and direct approach to kidney tumors. (Cincinnati) CLARENCE D. POCKLIS, M.D.

#### BLADDER, URETHRA, AND PENIS

Rühmer, B. von. Experience With Diverticula of the Bladder. (Erfahrungen über Blasen- oder Harnbläschen) *Arch. f. Urol. Chir.* 1914, 40: 8.

von Rühmer first discusses the various forms of diverticula of the bladder and their dangers. He then reports in detail twelve cases observed by him and discusses them critically.

In his surgical treatment of such diverticula he makes an infrapubic incision in the midline and opens the bladder as the diverticulum is more easily separated from the surrounding tissues with finger introduced into it. He recommends that the internal urethral opening be tested for rigidity as this condition seems to be rather common. If rigidity is present, he incises the hypertrophied and rigid internal sphincter on both sides with scalpel and removes only the lower portion. In one case he obtained good result from merely the bilateral incision. If ureter opens into the diverticulum, he resects it and implants it in another site in the bladder. In cases of diverticulum of the bladder associated with

hypertrophy of the prostate he operates in several stages. If the diverticulum cannot be freed from its adhesions, he fixes it to the abdominal wall and drains it externally after dissecting its neck from the bladder and closing the opening in the bladder. The diverticulum then becomes gradually obliterated. When this procedure is impossible, removal of the mucosa with a sharp spoon or curette is considered sufficient.

Von Rihmer's conclusions with regard to the surgical treatment of diverticula of the bladder is summarized as follows:

When the diagnostic measures described have established the presence of a diverticulum which is due to obstruction in the urinary tract but empties simultaneously with the bladder, it is sufficient to remove the obstruction. In cases of retention diverticula with or without obstruction, the extra-peritoneal operation with removal of any obstruction should be done in one or two stages, depending upon the development of infection and the patient's condition. (COLMERS) LEO A. JUNKER, M.D.

Marion, G., and Kogan, B. Incrusted Cystitis (La cystite incrustée). *Presse méd.*, Par. 1934, xcii, 1812.

The authors describe incrustated cystitis, a condition first reported by Fenwick, as a true infiltration of the mucous membrane and submucous tissue of the urinary bladder by calcareous deposits. It can be readily distinguished from the common calcareous deposits seen on the bladder mucosa in cystitis of long duration and from those which are often observed on the surface of an ulceration of the bladder.

As a rule the onset of incrustated cystitis cannot be determined clinically. While the incrustations usually appear suddenly as a complication of chronic cystitis, they sometimes form rapidly in the course of acute cystitis. They may occur also in association with a tuberculous cystitis which fails to clear up after nephrectomy or may be found when new symptoms develop after an intravesical operation. Urgency and frequency may be extreme, and pain, especially at the end of micturition, is common. The two chief signs of the condition are a terminal hæmaturia with clotted blood and the expulsion of calcareous concretions.

The diagnosis can always be made on cystoscopic examination. Besides more or less extensive and marked reddening of the mucosa, œdema, and areas of hæmorrhage, there are found the characteristic and more or less striking plaques. These plaques are in general white, but in some areas may be gray or even black. Their surface is irregular rather than flat like that of the leucoplakic plaque. They present a granulated appearance. They are usually multiple. Frequently they appear almost confluent, but as a rule are separated by areas of red mucosa.

Histologically, the lesions show three distinct zones—a superficial zone with epithelial desquamation, ulceration, and incrustations of calcium phosphate, a submucous zone showing marked infiltration

with small lymphocytes and polymorphonuclears, marked vascular engorgement, and bacteria, and a muscular zone intact or completely sclerosed.

The treatment indicated depends upon the degree of involvement. In mild cases the instillation of silver nitrate may be beneficial. In more severe cases the best results have been obtained from curettement. In the female curettement may be accomplished transurethrally after dilatation of the urethra, but in the male the lesions must be attacked suprapubically. WILLIAM C. BECK, M.D.

Watson, E. M. Complete Rupture of the Urethra. A Method of Repair in Delayed Cases. *J. Urol.*, 1935, 33, 64.

The author reports a method to restore to satisfactory function the completely severed deep urethra after its repair has been unnecessarily delayed.

When the urologist first sees a case of rupture of the urethra in which repair has been delayed, marked fibrosis has usually taken place about the space between the prostatic urethra and the severed bulbomembranous portion. The end of the urethra is often retracted, entirely occluded, and drawn either lateralward or upward from its normal path. Pockets of infection may persist, sometimes with a sinus leading to the suprapubic region, the groin, the penneum, or the perirectal spaces, and the diverted urinary path has become a hardened fistulous tract.

Watson reports three cases in which operation was performed as follows:

After suitable skin and genital sterilization, the patient was placed in the exaggerated lithotomy position and a sound gently introduced into the urethra as far as it would go. An inverted U incision was then made in the penneum, the levatores ani were pushed back, and the transversus perinei was brought forward. The central tendon of the penneum was cut across and the anterior end of the urethra located. The latter was freed up to its distal point, care being taken to preserve as much of the urethra as possible. The rectum was pushed back, the end of the prostate identified, and the hardened scar tissue about the prostatic opening or about the urethra excised. A No. 28 catheter was then introduced through the urethra, across the wound, and into the bladder. When the freed end of the anterior urethra was pulled down as far as possible toward the prostatic portion, there still remained an unbridged portion of about 1½ in. At this point, two flaps were cut, one from either side of the anterior urethra. With maintenance of a base attachment to the anterior urethra, the freed flaps were rotated, their distal ends sutured to the prostatic urethra, and three submucosal supporting sutures placed around the flaps, the catheter being used as a splint. The penurethral tissue was then built up around the anastomosed portion, the levatores ani were brought together, and the skin and subcutaneous tissue closed around an oil-silk drain carried down to the penurethral layer and brought out at the lower angle of the wound.



In both cases a satisfactory clinical recovery resulted. The urine became free from infection and urination became normal. In one case, there was a moderate stricture.

ELMER REED, M.D.

#### GENITAL ORGANS

Young, H. H.: Prostatic Calculi. *J. Urol.* 934, 3, 660.

This article is based on 100 cases of prostatic calculi found in the records of the Brady Urological Institute, Baltimore. The patients ranged in age from twenty to eighty-nine years, but the greatest number were between fifty and fifty-nine years. The calculi were associated with benign adenomas of the prostate in 29 cases, with chronic prostatitis in 50, and with chronic prostatitis and carcinoma in 16. In 6, they were found following the formation of a prostatic abscess, and in 5 in the prostatic fossa after prostatectomy. In 7 cases there was no clinical evidence of prostatitis. In 1 case they were found in the utricle.

Young divides prostatic calculi into those of the endogenous type and those of the exogenous type. The former are formed within the substance of the prostate, whereas the latter are formed in diverticula of the prostatic urethra or enter the urethra from the kidney or bladder. The endogenous calculi are the more interesting because of the difficulty in explaining their origin and location and their relationship to other pathological conditions of the prostate such as hypertrophy, carcinoma, infections, and abscesses. Young divides endogenous calculi into the following 4 groups: (1) those associated with prostatitis, (2) those associated with hypertrophy, (3) those suggesting carcinoma, and (4) those occurring in both the prostate and the urinary tract. He reports illustrative cases of each of these types and of the exogenous type.

Of the reviewed cases of calculi associated with prostatitis, a history of gonorrhea was given in 54 per cent. The prostatic symptoms developed soon after the gonorrheal infection. However, Young states that calculi often follow a gonorrheal infection without symptoms for many years. In 9 of the reviewed cases diagnosis of stricture was made. In rare instances the calculi erode the urethral mucosa and are passed with the urine or remain within the prostatic urethra. Obstruction to urination occurred in 30 per cent of the reviewed cases of calculi with prostatitis. Sexual powers are impaired very little, if at all, by the presence of prostatic calculi.

The diagnosis of the presence of calculi with prostatitis is usually made by X-ray examination. In only a small percentage of the reviewed cases were the calculi revealed by crepitation when pressure was made on the prostate with the finger.

The treatment in the reviewed cases of calculi associated with prostatitis varied greatly. In many cases in which the prostate is filled with small calculi the patient is quite comfortable. When the

calculi cause irritation, burning, pain, hematuria, difficulty and frequency of urination, marked obstruction, and back-pressure, the author has urged their removal. He states that the punch operation and transurethral resection are not to be recommended in such cases as they would usually be incomplete. Whenever possible, perineal prostatectomy or prostatolithotomy should be done. The ideal operation is removal of the stones without opening of the urethra. This can often be accomplished with a curette through lateral incisions into the prostatic capsule, the lobes being removed with scissors or a knife. Calculi in the median portion can also frequently be removed from one of the lateral cavities. A median bar can be excised with a knife or scissors.

In cases of prostatic calculi associated with prostatic hypertrophy the calculi are found almost invariably outside the hypertrophied lobes, generally in the fibrous capsule of the lobe and separate from the non-hypertrophied prostatic tissue around it. Young believes that the calculi form in the acini or ducts of the normal prostatic tissue that is being compressed just outside the growing adenomatous lobe. He states that such stones are removed best by the perineal route. CLAUDE D. HOLMES, M.D.

Gordon-Taylor, G.: Multiple Fibromas of the Tunica Vaginalis. *Br. J. Urol.* 934, 6, 330.

The case reported was that of a man forty-two years of age who consulted the author because of a firm, painless swelling of an imperfectly descended left testicle. There was a history of injury four years after receiving the injury the patient consulted a physician and was told that there was no cause for anxiety regarding its effects. Ten years later, when he was thirty-two years of age, he was pressed as fit for the army although the swelling had increased in size. At the age of forty-two he presented himself for life insurance, but was rejected because of diagnosis of tuberculous disease of the epididymis. Another physician regarded the condition as malignant neoplasm.

There was no history of venereal disease and the Wassermann reaction was negative. The diagnosis of a malignant growth of an undescended testicle was made and operation advised. At the present time, more than ten years after the operation, the patient is in perfect health.

The pathological report shows that the testis and tunica vaginalis formed a firm mass measuring by 1.5 by 1.5 in. On section, the parietal layer of the tunica was found to be greatly thickened by grayish fibrous tissue measuring 3/4 in. in its thickest part. The inner surface of both layers showed several pedunculated fibrous nodules up to 1/4 in. in diameter. The body of the testis appeared healthy and free from fibrosis. On microscopic examination the thickened tunica was found to consist of dense fibrous tissue in which are collections of chronic inflammatory cells, mainly plasma cells. Section of one of the pedunculated nodules showed dense

fibrous tissue These findings suggested a long-standing chronic inflammation of the tunica vaginalis

The author therefore diagnosed the condition as multiple fibromata of the tunica vaginalis, a benign lesion This diagnosis could be made only by microscopic examination of the removed organ

ELMER HESS, M D

### MISCELLANEOUS

Decker, P Urinary Colibacillosis (Colibacillose urinaire) *Rev med de la Suisse Rom*, 1934, p 1063

After forty years of study it still remains to be determined whether infection of the urinary tract takes place by the ascending or the hæmatogenous route.

The theory that pyelitis is a hæmatogenous infection dates from the work of Albarran in 1889 In 1894, Escherich concluded that the infection was ascending because of the greater frequency of pyelonephritis in female infants than in male infants, but in 1905 Cathala claimed that he had demonstrated the intermediate stage of the hæmatogenous mode of invasion by means of blood cultures

In the course of subsequent studies no investigator has demonstrated with certainty that a septicæmic state precedes the infection of the urinary tract. In the majority of cases the urinary infection is present first and the blood invasion appears to be secondary

According to the evidence obtained from blood cultures, the work of Heitz-Boyer represents no advance over that of Cathala in 1905 Of the other proofs of a silent blood invasion, cures of colibacilluria by treatment of the intestine seem most important, but in the author's opinion the cases cited are not convincing

With regard to the evidence offered by intermittent bacilluria in patients suffering from intestinal stasis due to various causes, the author's studies are essentially negative Of 200 such patients, only 6 presented a bacilluria which could not be accounted for by the presence of a focus of infection

Decker maintains that the metastasis of infection from a focus in the tissues and the metastasis of infection from the intestinal lumen are not at all analogous, and to date there is no convincing evidence, either direct or indirect, that the latter occurs Besides ascending the urinary tract, the infection might spread by the lymphatic route quite as well as by the hæmatogenous route.

The treatment of colon bacillus infections of the urinary tract is discussed in detail Of the long used standard procedures—the administration of antiseptics by mouth, treatment to change the composition of the urine, disinfection by the direct introduction of antiseptics into the urinary tract, and immunological methods, the author seems to have confidence in only the first three He regards Besredka's anti-virus and the bacteriophage as of doubtful value.

ALBERT F DEGROAT, M D

activity. Moreover its blood supply is inadequate. Hence, the slightest vasomotor disturbance may lead to necrosis, particularly during the age of growth when the blood demand is increased.

This theory agrees with the general view that trauma is to be ruled out as the direct cause of the condition. However there is probably also involved an individual predisposition, the result of preceding osteochondritis at the time of ossification which in this early period has remained latent or has healed, leaving the bone in a markedly weakened condition.

RICHARD E. SONICK, M.D.

Koch, S. L. *Disabilities of the Hand. J Am M A*  
1915. 9:5. 94-95

Koch says that when once joint fixation has taken place, some form of active treatment must be undertaken to permit movement. Four methods are available: (1) splinting and physical therapy (2) manipulation, (3) extra-articular operations, and (4) intra-articular operations.

If absolute fixation at the joints has not occurred, considerable improvement can often be obtained by splinting and judiciously applied physical therapy. In the application of splints the author prefers the use of elastic tension maintained for six, eight, or ten hours of the twenty-four. The tension should be released when it begins to cause pain. Splints should be of a type that can be easily applied to the hand and easily removed.

Better results will be obtained if, in the beginning of the treatment, the splint can be completely removed to permit the use of contrast baths, the application of heat, and active and passive movement alternately with the application of tension.

The attempt to secure movement in stiff joints by manipulation under anesthesia has often resulted in increased stiffness rather than increased mobility.

Manipulation is of value in cases in which adhesions have not completely prevented movement. The part should be moved to the affected joint once or twice through its complete range of motion. If the hand and forearm are then immobilized for twenty-four hours and active and passive movement is begun promptly afterward, definite improvement in function can be obtained.

In 1920 Shaw emphasized that if the fingers are kept immobilized in extension, shortening of the collateral ligaments of the metacarpophalangeal and interphalangeal joints occurs and that this shortening constitutes an important factor in the stiffness of the extended fingers and their resistance to movement of flexion. If showed, furthermore that if the ligaments are carefully detached from their origin on the head of the metacarpal bone a definite degree of restoration of flexion can be obtained and physical therapy. The author states that he has obtained excellent results by Shaw's operation in a number of cases.

Fixation of the fingers in flexion at the interphalangeal joints is usually complicated by flexion

contracture of the superficial flexors and fixation of the flexor tendons by scar tissue due to the original injury. Contraction of the joint capsule and the accessory ligaments also plays an important part in this disability.

The author credits Silver with emphasizing the important rôle played by contraction of the joint capsule in this type of contracture and describing an effective method of treatment—subperiosteal separation of the joint capsule, usually on the side of the convex or condylar segment of the joint.

Koch has used Silver's procedure in five cases and considers it definitely superior to violent rupture of the capsule by blunt dissection. He states that in cases with shortening of the collateral ligaments, recurrence of the flexion deformity will take place unless the proximal attachment is divided or freed.

In the treatment of joints which have become ankylosed as the result of infection or injury some form of intra-articular operation is necessary.

The author emphasizes several details which are of importance in attempts to secure movement at the wrist joint in cases of bony fusion. These are: (1) exposure of the joint by two lateral incisions, one on the radial and one on the ulnar side, to give adequate access to the entire joint area. (2) Minimal traction on, and trauma to, the extensor tendons. (3) The removal of sufficient bone to insure an adequate joint space. (4) The removal of the two rows of carpal bones. (5) Shaping of the remaining of the newly formed joint surfaces so that they are receivable as nearly as possible those of the normal joint. (6) The securing of smooth bone margins so as to avoid leaving overhanging edges of bone which might predispose to new formation of bone and subsequent interference with freedom of movement.

While the results from this type of operation have been far from perfect, definite improvement has been obtained in a considerable number of cases. Koch believes that with greater care in operative procedure and more persistent efforts to secure active movements following operation, the results will be improved.

NORMA C. B. LOCK, M.D.

Guentz, Z. *The Diseases of the Intervertebral Joints (Die Erkrankungen der Zwischenwirbelsäule)*. Arch f orthop Chir. 9:14. 24. 1933

The author examined a large number of spines especially with regard to the intervertebral joints. Normally the articular capsules are quite wide, the dissection cavities are spacious, and the mobility of the joints is considerable. However, the firm union of the vertebral bodies through the intervertebral disks. The position of the joints is different in different parts of the vertebral column, ranging from 45 degrees to nearly vertical.

When the normal stability of the vertebrae becomes reduced, displacements in the vertebral joints occur quickly, as the ligamentous system has tendency to compress the individual vertebrae.

against each other. As the capsular ligaments are unusually tight, their incomplete division when the joint is opened is more apt to be followed by the breaking off of an articular process than by rupture of the capsular joint. The articular surfaces consist of smooth, hyaline articular cartilage which in certain vertebrae may vary in size on the two sides. The thickness of the cartilage presents considerable variations even under normal conditions.

As a rule no pathological deviations are to be observed up to the age of thirty years. Thereafter, changes which are sometimes marked become continuously more frequent. These consist of progressive destruction up to complete bony rigidity. In the mildest grades there is a definite dryness of the articular cartilage due to absence of fluid in the joint. Defects and proliferations are still absent in this stage.

In contrast are the changes in which there is an increase of fluid in the joint and the cartilage appears swollen. Not infrequently there is a partial yellow discoloration of the cartilage.

From these initial changes arise all transitions to complete destruction of the articular cartilage. In one and the same individual both normal joints and those showing the most marked changes may be found. In the cases reviewed no relationship to other diseases of the individual could be demonstrated according to the detailed autopsy protocols. On the other hand, the changes were entirely different from those occurring in early spondylarthritis ankylopoietica. The most severe changes were found especially often in the thoracic portion of the vertebral column and occurred predominantly on the right side. In the author's opinion this is explained largely by the fact that the third to the fifth thoracic vertebrae show the least mobility.

A relationship of diseases of the vertebral joints to changes in the intervertebral disks could not be demonstrated. Neither was it possible to demonstrate a definite relationship to existing kyphoses or compensatory lumbar lordosis.

On the other hand, 8 scolioses examined showed striking unilateral changes in the vertebral joints on the concave side, 2 showed unilateral changes on the convex side, and 1 showed bilateral changes. In spite of the relatively small amount of material, the author suggests that in certain types of scoliosis the cause is unilateral disease of the small vertebral joints.

A review of the macerated specimens showed that in spondylitis at the site of the gibbus the small joints were completely ankylosed and the neighboring joints presented marginal exostoses. In cases of fracture the changes in the small vertebral joints paralleled those in the vertebral bodies. On the other hand, in cases of even severe spondylarthritis deformans the small vertebral bodies showed no striking changes. In Bechterew's disease, of which the author had the opportunity to examine a fresh case, there is no degenerative reaction but a typical arthritis with round cell infiltration, hyperæmia,

connective tissue proliferations, and ultimate healing by ossification. Not rarely, other joints show a polyarthritides ankylopoietica of the Ziegler type.

In conclusion the author calls attention to the disease picture of pseudo spondylolisthesis described by Junghans. In this condition also the intervertebral joints at the site of involvement exhibit marked changes. (DECS) LOUIS NEWELL, M.D.

Zadek, I. Congenital Coxa Vara. *Arch Surg*, 1935, 30: 62.

Zadek reviews the history of congenital coxa vara and the various theories regarding it back as far as the theory advanced by Fiorani in 1881. He states that the cause of the condition is unknown and the microscopic picture is not characteristic. In the examination of a removed section including portions of the articular cartilage and the neck of the femur he found degenerative changes in the deeper layers of the cartilage with areas suggestive of mucinous degeneration and tiny intracartilaginous cysts formed apparently as the result of liquefaction of the cartilage. The subchondral bone was compact, there being widespread subchondral osteosclerosis which extended through the entire capital epiphysis.

The striking signs of the condition in childhood are deformity and a painless limp. The gait may easily be confused with that of congenital dislocation of the hip, but the roentgen appearance is pathognomonic. The obvious change is a depression of the neck of the femur. Closer examination suggests a loss of substance in the neck which, to the inexperienced, may suggest a fracture with non-union. The greater trochanter is elevated, and in the older cases becomes much elongated and assumes a "beaked" appearance.

In the author's opinion the treatment should include drilling of the neck of the femur to open up a new blood supply and thereby stimulate ossification. Either at the same time or later a wedge osteotomy of the subtrochanteric type should be done to correct the angle of the neck.

Ten successfully treated cases are reported.

ROBERT C. LONERGAN, M.D.

Loggòscino, D. Tuberculosis of the Neck of the Femur (*La tubercolosi del collo del femore*). *Chir. d'organi di movimento*, 1934, 19: 295.

The author classifies tuberculous lesions of the neck of the femur on the basis of the local arterial supply and distinguishes four main foci of infection.

Foci derived from the inferior cervicodiaphyseal arch include those which are located immediately above the lesser trochanter and extend a few centimeters below the extreme limit of the inferior cervical arch. These foci probably arise from emboli which have been caught in the initial course of the vessel. This lesion occurs most frequently and its clinical course is apt to be severe.

Roentgenologically the bone has an evanescent appearance and the lesion assumes a semilunar

# SURGERY OF THE BONES JOINTS MUSCLES TENDONS

## CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Young, A. G., and MacLachlan, H. E. Chronic Proliferative Arthritis in Patients with Rheumatic Fever. *J Bone & Joint Surg* 93A: 7-11

The relationship between acute rheumatic poly arthritis and chronic proliferative arthritis has long been a subject of controversy. Since Heberden in 178 and Haygarth in 1803 first differentiated acute rheumatism from chronic rheumatism, clinicians have been divided into two schools—those who believe that the two conditions are entirely separate and those who consider them different manifestations of the same process.

The authors maintain that there is no justifiable reason, clinical or pathological, for the adoption of such extreme viewpoints. Each condition may occur alone and absolutely independently of the other where as in certain cases there seems to be a definite sequential relationship between the two conditions.

The authors summarize ten of thirty collected cases and report two cases.

In every case the condition began as acute rheumatic polyarthritis and, as it became chronic, trophic changes developed in the joints.

The age at the time of the first attack ranged from eight to forty-five years and the duration of the arthritis from six months to twenty-five years. Of the ten patients whose cases are summarized, nine had mitral stenosis when they were admitted to the hospital. The tenth was treated shortly after the onset of the disease and recovered without sustaining valvular damage.

Apart from the cardiac findings, there were no clinical signs or symptoms to distinguish the conditions from acute or chronic (non-rheumatic) infectious or rheumatoid arthritis. The roentgenographic and laboratory findings were of no value in the differential diagnosis.

Investigators studying rheumatic fever have at different times observed various tissue reactions—namely large subcutaneous nodules, microscopic nodules of the myocardium and loose tissue about the joints, proliferative changes of the endocardium of the synovial and lesions of blood vessels—each they have regarded as characteristic of it or specific for rheumatic infection.

Fuhr maintains that Aschoff's nodule is a specific product characteristic of the disease, and that its presence alone is sufficient to justify the diagnosis of "rheumatic granulomatosis."

In the cases presented by the authors the occurrence of the joint disease was so closely associated with the onset and progress of the rheumatic fever

as to render it obvious that the arthritis was part of the rheumatic fever. Moreover the joints affected were those involved by infectious (non-rheumatic) arthritis.

In conclusion the authors state that the differentiation between cases of rheumatic fever with polyarthritic manifestations and chronic proliferative arthritis (non-rheumatic) is a problem for the clinician. In the light of present knowledge, the histological study of tissues from lesions that have definitely healed or have become chronic and progressive offers little or no aid, and in cases showing the characteristic subcutaneous or subendocardial nodules a differential diagnosis has not been proved.

Swaim, L. T. Orthopedic and Physical Therapeutic Treatment of Chronic Arthritis. *J Am M A* 93A: 93-99

The orthopedic treatment of chronic arthritis should be begun at the very onset of the arthritis and carried out in close relationship to the medical care.

There are three objectives in the treatment of chronic arthritis: (1) to control and stop the disease, (2) to prevent deformity, and (3) to restore the patient to his normal life as functionally capable as possible.

Arthritis is always a constitutional disease. The joint inflammation is only a symptom. The heat regulating apparatus and the circulation are disturbed, the vasomotor control is unstable, the blood pressure is low, the basal metabolic rate is often subnormal, and the function of the gastro-intestinal tract is defective. There is always secondary anemia. Not infrequently correction of posture by systematic corrective exercise, rest, and corrective postures will remedy many of the functional physiological failures. The treatment of every case of arthritis should begin with rest positions in bed. The author describes the various rest positions that may be used.

While the patient is in bed heat may be applied by hot air bales, steam baths, diathermy, infrared irradiation, or sun lamp.

Efforts to prevent deformities should be instituted early in the disease. Almost every deformity in arthritis is from deformity. The author advocates the use of supporting plaster splints for periods of not more than forty-eight hours. In his cases the plaster used is bivalved and the joint is moved a little each day. Gradually the time of exercise is increased and the period of rest shortened. Deformities that have already occurred may be corrected by various methods. Joints that have

begun to flex can often be straightened by plaster splints re applied every day or two or by the use of corrective splints such as the Thomas caliper splint for the knee, banjo splints for the hand, cock-up splints for the wrist, and the urplane splint for the shoulder. In cases in which correction cannot be obtained by such means, manipulation of the joints may be done under anesthesia and, if this fails, by open operation after the process has become quiescent. The results of operation are improved by 1 month or two of pre operative physical therapy and exercise.

NORMAN C. BULLOCK, M.D.

Rahm, H. Predisposition in Osteochondritis Dissecans of the Capitulum Humeri (Zur Frage der Disposition bei der Osteochondritis dissecans Capituli humeri) *Zentralbl. f. Chir.*, 1934, p. 2263.

Trauma is coming to be regarded more and more as playing only an occasional rôle in the development of osteochondritis dissecans. Recently Nielsen attempted to determine the importance of heredity in this disease. According to his large series of investigations the general incidence of the condition is 4.1 per cent, whereas the follow up of 191 unselected relatives of patients suffering from the condition revealed an incidence 4 times as high. Therefore this disease must be included in constitutional pathology.

The author presents the histories and roentgenograms of 4 male members of a family who were affected with osteochondritis dissecans of the capitulum of the humerus. In all of these subjects the condition began at the age of puberty, between the fourteenth and sixteenth years of life. All of the subjects were of the stocky type. Two other males of the family were similarly diseased but could not be examined. The fact that the disease began at the time of puberty, when the condition of the open epiphyseal lines of the skeletal portions forming the elbow joint undergoes transition into that of synostosis, suggests that the cause is a defect in this process due to a constitutional-endocrine factor. Hereditary constitutional factors are undoubtedly of fundamental importance.

The first of the cases reported was that of a former twenty-five years of age who had been unable to extend his elbow since his fifteenth year. He was of the short, stocky type with powerful muscles. The blood picture was normal. The blood belonged to Group o. The roentgenograms showed a severely deforming osteo-arthritis in both elbows involving especially the capitulum of the humerus but also the capitulum of the radius and the ulna.

The second case was that of brother of the first patient who was seven years older than the latter. The patient stated that the condition began when he was fourteen years old. He was of a stocky type like his brother. He had a high changing voice. His blood belonged to Group o. The clinical and roentgen findings in both elbows were similar to those in the first case.

The third case was that of an uncle (brother of the mother) of the two other patients. This patient was forty eight years old, 154 cm high, and of athletic build. His blood belonged to Group o. The disease began in the right elbow in the sixteenth year of life. The changes in both joints were similar to those in Cases 1 and 2.

The fourth case was that of the son of the third patient, who was thirteen years, 140 cm high, and of the same body build as his father. There was limitation of motion in both elbow joints. Roentgen examination showed closure of the epiphyseal line of the right humerus, distinct osteitis at the typical site in the capitulum of the humerus, subchondral clear areas, and beginning changes in the capitulum of the radius. In the left arm the epiphyses were still distinct and no pathological changes were as yet demonstrable.

(WORMANN) LOUIS NLUWELT, M.D.

Mollo, L. Necrosis of the Semilunar Bone of the Wrist (La necrosi dell'osso semilunare del carpo) *Chir. d. organi d. movimento*, 1934, 19: 343.

The author reports a case of Kienboeck's disease in a nineteen-year-old girl who was unable to recall any trauma to the wrist. After removal of the bone and a period of immobilization, recovery resulted uneventfully and function was completely restored. Bacteriological cultures were negative.

On microscopic examination of the bone the deeper and more diffuse lesions were found to involve the central portions, in which most of the trabeculae were atrophic, often fragmented, and arranged in a disorderly fashion with complete obliteration of the lamellar structure.

Osteocytes were practically absent in this area whereas they seemed to be rather well preserved at the periphery. The articular cartilage was interrupted in some places, particularly where the bone had undergone retrogressive changes.

The most important changes involved the bone marrow. Among these were connective tissue proliferation with subsequent sclerosis and a tendency toward osseous metaplasia. In other portions there was a homogeneous substance which assumed the form of blocks or granules of a brownish-yellow color suggesting the deposition of hæmosiderin. This deposition of pigment was found also in the region between bone and cartilage. No inflammatory or vascular changes were observed.

Taken as a whole, the lesions consisted of necrotic areas of the central portion of the bone which in all probability were the result of some kind of circulatory disturbance. This assumption appears plausible because of the deposition of blood pigment in the medullary areas although there was no histological evidence to support it. The cartilaginous erosions were probably secondary to the central necrosis.

With regard to the pathogenesis of the condition, the author states that the semilunar bone is exposed to considerable physiological strain augmented by repeated traumatism resulting from ordinary manual

activity. Moreover its blood supply is inadequate. Hence, the slightest vasomotor disturbance may lead to necrosis, particularly during the growth when the blood demand is increased.

This theory agrees with the general view that trauma is to be ruled out as the direct cause of the condition. However there is probably also involved in an individual predisposition, the result of a preceding osteochondritis at the time of ossification which healed, leaving the bone in a markedly weakened condition.

Koch, R. L.: *Disabilities of the Hand*. J Am M Ass 935 04 30

Koch says that when once joint fixation has taken place some form of active treatment must be undertaken to permit movement. Four methods are available: (1) splinting and physical therapy, (2) manipulation, (3) extra-articular operations, and (4) intra-articular operations.

If absolute fixation at the joints has not occurred, considerable improvement can often be obtained by splinting and judiciously applied physical therapy. In the application of splints the author prefers the use of elastic tendon maintained for six, eight or ten hours of the twenty four. The tension should be released when it begins to cause pain. Splints should be of a type that can be easily applied to the hand and easily removed.

Better results will be obtained if in the beginning of the treatment, the splint can be completely removed to permit the use of contrast baths, the application of heat, and active and passive movement alternately with the application of tension.

The attempt to secure movement in stiff joints by manipulation under anesthesia has often resulted in increased stiffness rather than increased mobility.

Manipulation is of value in cases in which adhesions have not completely prevented movement. The part should be moved at the affected joint once or twice through its complete range of motion. If the hand and forearm are then immobilized for twenty-four hours and active and passive movement is begun promptly afterward, definite improvement in function can be obtained.

In 1930 Shaw emphasized that if the fingers are kept immobilized in extension, shortening of the collateral ligaments of the metacarpophalangeal and the interphalangeal joints occurs and that this shortening constitutes an important factor in the stiffness of the extended fingers and their resistance to movements of flexion. He showed, furthermore, that if the ligaments are carefully detached from their origin on the head of the metacarpal bone, definite improvement in the degree of restoration of flexion can be obtained by physical therapy. The author states that he has obtained excellent results by this operation in a number of cases.

Fixation of the fingers in flexion and the interphalangeal joints is usually compensated by flexion

contracture of the superficial tissues and fixation of the flexor tendons by scar tissue due to the original injury. Contraction of the joint capsule and the accessory ligaments also play an important part in this disability.

The author credits Silver with emphasizing the important role played by contraction of the joint capsule in this type of contracture and describing as effect a method of treatment—subperiosteal separation of the joint capsule, usually on the side of the convex or condylar segment of the joint.

Koch has used Silver's procedure in five cases and considers it definitely superior to violent rupture of the capsule by blunt dissection. He states that as cases with shortening of the collateral ligaments, recurrence of the flexion deformity will take place unless the proximal attachment will take place.

In the treatment of joints which have become ankylosed as the result of infection or injury some form of intra-articular operation is necessary.

The author emphasizes several details which are of importance in attempts to secure movement in the wrist joint in cases of bony fusion.

- (1) exposure of the joint by two lateral incisions, one on the radial and one on the ulnar side, to give adequate access to the entire joint area with minimal traction on, and trauma to, extensor tendons;
- (2) the removal of sufficient bone to insure an adequate joint space, which at times means removal of both rows of carpal bones;
- (3) shaping of the contours of the newly formed joint surfaces so that they resemble as nearly as possible those of the normal joint and (4) the securing of smooth bone margins so as to avoid leaving overhanging edges of bone which might predispose to new formation of bone and subsequent interference with freedom of movement.

While the results from this type of operation have been far from perfect, definite improvement has been obtained in a considerable number of cases. Koch believes that with greater care in operative procedure and more persistent efforts to secure active movements following operation, the results will be improved.

NOVAK, C. BULLOCK, M.D.

Gusanti, E.: *The Diseases of the Intervertebral Joints* (Die Erkrankungen der 2 intervertebralen Gelenke). Arch f orthop Chir 93:4-34 133

The author examined a large number of spines especially with regard to the intervertebral joints. Normally the articular capsules are quite wide, the articular cavities are spacious, and the mobility of the dissected joints is considerable. However, the joints are securely locked by the ligaments and the firm union of the vertebral bodies through the latter in different parts of the spine is different from 45 degrees to nearly erect.

When the normal stability of the vertebrae becomes reduced displacements in the vertebral joints occur quickly as the ligamentum flavum has a tendency to compress the individual vertebrae.

against each other. As the capsular ligaments are unusually tight, their incomplete division when the joint is opened is more apt to be followed by the breaking off of an articular process than by rupture of the capsular joint. The articular surfaces consist of smooth, hyaline articular cartilage which in certain vertebræ may vary in size on the two sides. The thickness of the cartilage presents considerable variations even under normal conditions.

As a rule no pathological deviations are to be observed up to the age of thirty years. Thereafter, changes which are sometimes marked become continuously more frequent. These consist of progressive destruction up to complete bony rigidity in the mildest grades there is a definite dryness of the articular cartilage due to absence of fluid in the joint. Defects and proliferations are still absent in this stage.

In contrast are the changes in which there is an increase of fluid in the joint and the cartilage appears swollen. Not infrequently there is a partial yellow discoloration of the cartilage.

From these initial changes arise all transitions to complete destruction of the articular cartilage. In one and the same individual both normal joints and those showing the most marked changes may be found. In the cases reviewed no relationship to other diseases of the individual could be demonstrated according to the detailed autopsy protocols. On the other hand, the changes were entirely different from those occurring in early spondylarthritis ankylopoietica. The most severe changes were found especially often in the thoracic portion of the vertebral column and occurred predominantly on the right side. In the author's opinion this is explained largely by the fact that the third to the fifth thoracic vertebræ show the least mobility.

A relationship of diseases of the vertebral joints to changes in the intervertebral disks could not be demonstrated. Neither was it possible to demonstrate a definite relationship to existing kyphoses or compensatory lumbar lordosis.

On the other hand, 8 scolioses examined showed striking unilateral changes in the vertebral joints on the concave side, 2 showed unilateral changes on the convex side, and 1 showed bilateral changes on spite of the relatively small amount of material the author suggests that in certain types of scoliosis the cause is unilateral disease of the small vertebral joints.

A review of the macerated specimens showed that in spondylitis at the site of the gibbus the small joints were completely ankylosed and the neighboring joints presented marginal exostoses. In cases of fracture the changes in the small vertebral joints paralleled those in the vertebral bodies. On the other hand, in cases of even severe spondylarthritis deformans the small vertebral bodies showed no striking changes. In Bechterew's disease, of which the author had the opportunity to examine a fresh case, there is no degenerative reaction but a typical arthritis with round-cell infiltration, hyperæmia,

connective tissue proliferations, and ultimate healing by ossification. Not rarely, other joints show a polyarthritis ankylopoietica of the Ziegler type.

In conclusion the author calls attention to the disease picture of pseudo spondylolisthesis described by Junghans. In this condition also the intervertebral joints at the site of involvement exhibit marked changes.

(DELS) LOUIS NEUWELT, M.D.  
Zadek, I. Congenital Coxa Vara. *Arch Surg*, 1935, 30: 62.

Zadek reviews the history of congenital coxa vara and the various theories regarding it back as far as the theory advanced by Fiorani in 1881. He states that the cause of the condition is unknown and the microscopic picture is not characteristic. In the examination of a removed section including portions of the articular cartilage and the neck of the femur he found degenerative changes in the deeper layers of the cartilage with areas suggestive of mucinous degeneration and tiny intracartilaginous cysts formed apparently as the result of liquefaction of the cartilage. The subchondral bone was compact, there being widespread subchondral osteosclerosis which extended through the entire capital epiphysis.

The striking signs of the condition in childhood are deformity and a painless limp. The gait may easily be confused with that of congenital dislocation of the hip, but the roentgen appearance is pathognomonic. The obvious change is a depression of the neck of the femur. Closer examination suggests a loss of substance in the neck which, to the inexperienced, may suggest a fracture with non union. The greater trochanter is elevated, and in the older cases becomes much elongated and assumes a "beaked" appearance.

In the author's opinion the treatment should include drilling of the neck of the femur to open up a new blood supply and thereby stimulate ossification. Either at the same time or later a wedge osteotomy of the subtrochanteric type should be done to correct the angle of the neck.

Ten successfully treated cases are reported.  
ROBERT C. LONGERGAN, M.D.

Logròscino, D. Tuberculosis of the Neck of the Femur (La tubercolosi del collo del femore). *Chir d'organi di movimento*, 1934, 19: 295.

The author classifies tuberculous lesions of the neck of the femur on the basis of the local arterial supply and distinguishes four main foci of infection. Foci derived from the inferior cervicodiaphyseal arch include those which are located immediately above the lesser trochanter and extend a few centimeters below the extreme limit of the inferior cervical arch. These foci probably arise from emboli which have been caught in the initial course of the vessel. This lesion occurs most frequently and its clinical course is apt to be severe. Roentgenologically the bone has an evanescent appearance and the lesion assumes a semilunar



shape. As the process approaches the bony cortex, atrophy and decalcification of the entire femur become more pronounced with a resulting reduction in length and thickness. The formation of a sequestrum or necrosis is visible long before a line of demarcation has formed.

The adjacent synovial membrane is at first little affected, but later the joint cavity is filled with a clear yellowish and aseptic fluid which subsequently becomes purulent. Panarititis is the usual outcome.

Foci in juxta position to the epiphysis are derived from the superior cervico-diaphyseal arch. The following three anatomical types, mentioned in descending order of frequency, can be differentiated in territory supplied by the inferior cervical arch:

1. Foci of the spur of the neck, which is in the so-called cruraiform foci (foci of the inter-medial tract of the neck) which, in the child, occupy a zone supplied by an independent and terminal arteriole.

2. Foci of the supero-external tract which are in the territory supplied by the corresponding artery.
3. Foci in the juxta-epiphyseal zone have certain physiopathological peculiarities which differentiate them from other anatomical types. As the result of the action of circulating toxins or disturbances of the circulation the intervening cartilaginous plate becomes necrotic. The entire bony segment is usually shortened.

Bulboepiphyseal foci occupy a territory which is supplied by the terminal branches of the synovial vessels of the cervico-trochanteric fossa.

Characteristic of this region are tuberculous cysts. Such cysts are located centrally in the bulbar region of the metaphysis and surrounded by a thick layer of osseous healthy tissue. They pursue a chronic course and may emerge considerably in the complete absence of symptoms.

The lesion is relatively benign and usually replaced by scar.

Metaphyseal subtrochanteric foci are located under the cartilaginous plate of the greater trochanter and in the limits between the metaphysis and diaphysis. They are semi-spherical and usually spread toward the superior cervical arch. They never invade the superior cervical arch. They invade the cartilage and rarely invade the diaphysis.

In some cases the cartilage becomes necrotic, the nucleus of the greater trochanter is destroyed, and a fistula develops in the gluteal region.

As a rule this type of lesion is benign and remains extra-articular.

The article contains many very instructive illustrations.

RICHARD E. BOWEN, M.D.

Lagergren, K. A. The Diagnosis of Metastatic Infection by Arthrography (Zur Frage des Diagnosen von Metastasenherden mittels Arthrographie). *Acta Chir. Scand.* 924, 75, 485.

Following review of the development of roentgenography of the joints and discussion of the

different opaque substances employed for the purpose the author reports his roentgenographic studies of the knee with the use of a 50 cm of percent solution of perabrodil.

With this opaque substance and by a simple technique Lagergren was able to demonstrate mechanical injuries in clinically uncertain cases. It was possible also to make a diagnosis of the type and extent of the damage which was subsequently confirmed by the findings of arthroscopy.

For good results it is very important to make the roentgenograms with the knee in an oblique direction as thereby relatively free projection of the different parts of the meniscus can be obtained.

Lagergren studied also the effect of the opaque substances on the joint. Before and after the injection of the opaque substance he made a cytological examination of the synovial fluid and determined its content of albumin. After the injection he determined its content of iodine. In a number of cases in which operation was performed twenty-four hours following the roentgen examination he excised a portion of the capsule for microscopic study.

On the basis of a number of cases which he discusses the interpretation of the roentgenogram, emphasizing particularly the difficulties in proper judgment of the lateral zone. This part of the article is illustrated with roentgenograms and drawings.

Colonna, P. C. Congenital Pseudarthrosis of the Leg. Three Cases Treated by Mammie Bone Graft. *J. Am. Med. Ass.* 924, 93, 302.

Congenital pseudarthrosis is a rather rare type of fracture. It is not merely a fracture that fails to unite, but a pathological condition in a bone or bones causing weakness with subsequent fracture. It is apparently most common in the bones of the leg. Codrville classified cases of congenital pseudarthrosis into the following three groups: (1) those in which the usual anterior fracture is present without fracture, (2) those presenting the typical pseudarthrosis, and (3) those with more or less loss of bony substance accompanied by marked deformity.

Before the occurrence of fracture definite changes may be observed in the bone. In this early phase there is anterior curving of the leg. When fracture occurs, the deformity is likely to be increased. The most common type of case is one in which definite pseudarthrosis is present in both bones with characteristic angular deformity of the lower third of the leg. The Wassermann reaction and the findings of chemical study of the blood are negative.

Following review of the various theories as to the cause of the condition, the author expresses the opinion that the cause is primarily local. He cites Codrville and Henderson that the basic factors are probably family embryonic development and congenital interference with the circulation. Colonna reports three cases in which massive bone grafting was done with successful bony union in two.

The article is concluded with the following summary:

- 1 Congenital pseudarthrosis has been rarely reported in the American literature
- 2 Congenital pseudarthrosis of the leg appears to be due to a local rather than a general cause, and to occur usually in the lower third of the leg
- 3 Before the occurrence of fracture the bone or bones involved present the characteristic roentgenographic appearance of a cystic formation somewhat resembling localized osteitis fibrosa cystica. The deformity is present at birth. Fracture occurs either at or shortly after birth, and hardly ever heals spontaneously
- 4 Operative treatment is not indicated before the age of eight years. The chances for successful results from operation increase with the age of the patient
- 5 The method of choice is the massive bone grafting technique employed in the three cases reported

### SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC

Haas, S. L. The Treatment of Permanent Paralysis of the Deltoid Muscle. *J. Am. Med. Ass.* 1935 104 99

Permanent paralysis of the deltoid muscle causes a disabling deformity of the arm with resulting loss of the power of abduction. When conservative treatment for a year has failed, there still remains the possibility that function may be restored to some degree by surgical treatment. The author reviews and comments on the several procedures which have been advocated, including arthrodesis and muscle transplantation, and reviews the factors which must be taken into consideration in the choice of operation. He emphasizes that in muscle transplantation the muscle to be transplanted must be strong enough to carry out the function of the muscle for which it is to be substituted. He believes that the muscle most satisfactory for transplantation is the trapezius.

Haas reviews thirty-two cases of deltoid paralysis treated by muscle transplantation. In more than half of a series of thirty in which a trapezius fascia transposition was done a satisfactory functional result was obtained. The stronger the transposed muscle and accessory muscle the better was the result.

The operative technique used by Haas in his earlier cases is described as follows:

An incision beginning well out on the spine of the scapula is made along the spine to the acromion process and then to the outer third of the clavicle. The insertion of the trapezius is freed from the spine of the scapula and clavicle, with care to avoid including the supraspinatus muscle. The trapezius is then mobilized so that it forms a tongue-like mass, care being taken to protect its main nerve and blood supply. A sufficiently long and wide strip of fascia lata removed from the thigh is then sutured

to the raised up trapezius muscle with heavy braided silk. A ditch is cut out of the spine of the scapula just back of the acromion process and the free end of the fascia lata is passed through this ditch and over the apex of the shoulder in the subcutaneous fat to an incision made over the lower part of the paralyzed deltoid muscle. Through this second incision a rectangular piece of bone is removed from the humerus near the deltoid eminence through the second incision and the free end of the fascia is brought down to, and passed through, this opening in the cortex and sutured to the surrounding periosteum.

The results following this type of operation were at first quite good, but after a time there was a decrease in the range of motion. It was found that where the fascia passed through the ditch prepared in the acromion process it often became adherent to the bone. When this occurred it was necessary to re-operate to free the fascial strip and surround it with a free fat graft. The re-operations demonstrated that direct union occurs between fascia and muscle and the fascia lata assumes a tendon-like appearance. In the author's more recent operations the formation of the ditch in the spine of the scapula has been omitted. The fascia is now brought over the acromion process as a flat band and anchored in several places to the deltoid muscle or passed under the perimysium. The distal end is then passed under an elevated spicule of bone near the deltoid eminence and sutured to the surrounding periosteum. The low insertion is of considerable advantage because of the added leverage obtained on the humerus.

It was found also that after the muscle fascia operation, the results of which were at first quite satisfactory, a considerable loss of power occurred later because of a shift of the fascia transplant. The cause of the shift in the line of pull was usually a luxation of the humerus from the glenoid fossa. A careful check of the more recent cases showed that there is often an associated luxation of the shoulder in paralysis of the deltoid. This is not surprising as the strong deltoid muscle capping the shoulder joint helps to maintain the humerus in its normal apposition to the glenoid. If there has been a lack of adequate protection by a brace there is further stretching of the capsule which predisposes to dislocation. Haas calls attention to the fact that an abduction brace, when applied so as to hold the arm in the frontal plane of the body, has the pernicious effect of forcing the head of the humerus out of the glenoid cavity. Therefore, in conservative treatment with braces or plaster and for protection after operation it is important to see that the arm is directed a little anteriorly to the frontal plane of the body. When such a luxation is already present, it should be treated either before or at the time of the muscle operation. The Kiliani-Nicola, Henderson, and Kirchner-Fowler types of operation are adaptable to the paralytic type of dislocation. The Kiliani-Nicola operation has been found best as it

is relatively easy to perform and can be done at the same time as the muscle fasciae operation.

Before the fasciae transplant is anchored to the humerus the long head of the biceps is exposed by dissecting through the atrophied deltoid muscle. In dislocations to the medial side a modification of the Kilbourn-Nicola operation is used, the biceps tendon being cut in its end and the proximal portion passed through the humerus medial to the greater tuberosity and in lateral or posterior displacements it is passed lateral to the tuberosity. In this way corrective pull is obtained on the head of the humerus toward the glenoid cavity. Correction of the dislocation of the shoulder joint improves function as the fixation changes the line of pull and prevents strong fixation of the head in the glenoid. The importance of fixation of the head of the humerus has been emphasized by Mayer who showed that the first 90 degrees of motion after a trapezius fasciae transference is a fixed rotation of the humerus and scapula. Any subsequent abduction is a free motion between the scapula and humerus due to the pull of the biceps, coracobrachialis, or pectoralis major. This is the reverse of the normal movement of the upper extremity in abduction. In some cases the mechanism of motion after the operation is found to be similar to the normal movements of abduction.

In a number of the cases reported by the author only partial result could be expected at most as there was not sufficient muscle power to sustain either a muscle operation or an arthrodesis. Of importance is obtaining the maximum effect of the operation in a long period of postoperative physical therapy and postoperative protection from strain continued, if necessary for a year.

ROBERT C. LINDSEY, M.D.

Todd, A. H. The Treatment of Pes Cavus. *Proc Roy Soc Med Lond* 1934, 27.

The older methods of treating pes cavus often fail because they are based only on an attempt to correct the deformity. Even when correction of the deformity is accomplished the underlying cause is not corrected and recurrence develops. In the ordinary idiopathic type of pes cavus the deformity is entirely in the forefoot. It consists of a drooping down of the forefoot. There is no paralysis of the lumbrical or interossei muscles. The latter play only a passive part. This is evident from the fact that when the forefoot or anterior arch is pushed up the toes drop down into normal position unless soft-tissue contractures have occurred. Pes cavus is not due to a shortening of the tendo achillis. Shortening is secondary, not primary. The essential disturbance is the forefoot drop. The author believes its cause is a weakness of the long extensor group of muscles.

Todd's treatment of pes cavus consists in complete correction of the deformity and strengthening of the long extensor group of muscles to prevent recurrence. First, the deformity is corrected by lengthening and flattening the joint capsules, fasciae,

and tendon sheaths on the lower side of the foot. In addition, Steadler's section of all structures attached to the os cuneus is done as this allows the entire foot to elongate. The foot is then vigorously manipulated. In the second part of the operation the extensor tendons are transplanted through holes bored in the necks of the first, third, and fifth metatarsal bones and sutured firmly with the foot held in an over-corrected position. In cases with contraction of the soft parts of the toes, arthrodesis of the proximal interphalangeal joints is done and, if necessary, the deformed fifth toe is amputated.

This operation is usually best performed when the patient is between sixteen and eighteen years of age, but if the deformity is so marked that thick plantar calluses are formed it should be done earlier. The results are satisfactory and permanent. The operation is contra-indicated in the cases of elderly patients with marked contractures and in cases of deformities due to poliomyelitis or complete paralysis of the extensor tendon muscles.

CHRISTIE C. GUY, M.D.

## FRACTURES AND DISLOCATIONS

Fryberg, A. H. Congenital Luxation of the Hip. Selection of Cases for Open Reduction. *J Bone & Joint Surg* 1933, 15.

In reviewing the history of the treatment of congenital luxation of the hip Fryberg says that, in 1804, Lorenz, basing his opinion on an cases of open operation, contended that attempts at reduction by any closed method could fail, whereas two years later he advocated the closed method, and at the present time one of the outstanding proponents of closed manipulation is Pott. Successful results from the closed method require very early recognition of the condition. All cases of congenital dislocation of the hip may be classified as of the following 3 groups: (1) those in which closed reduction should doubtless be attempted, (2) those in which the advisability of even attempting closed reduction is debatable, and (3) those in which closed reduction is obviously out of the question because of severe marked deformity or body structure.

Fryberg believes that the technique of closed reduction has undergone very decided improvement, that the closed method will be successful in a good percentage of cases of congenital dislocation of the hip in young children and that open operation should be reserved for the cases of young children in which attempts at closed reduction have failed and for the cases of older children. He states that as end result studies of closed reduction accumulate in the literature, reports of structural changes causing marked limp, discomfort, pain, and even definite relaxation will doubtless appear, but that this might be said of open operation if it were performed routinely on young children.

In conclusion he says that he looks upon sufficient effort at closed reduction as an indispensable preliminary to the recommendation of open operation.

Open operation has a place as a method of reduction for congenital dislocation of the hip, but should not be regarded as a substitute for closed manipulation

PAUL C. COLONNA, M.D.

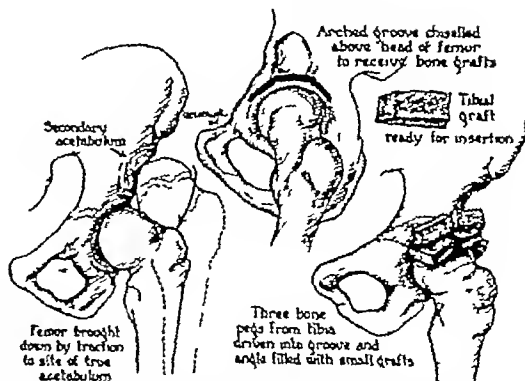
**Compere, E. L., and Phemister, D. B.** The Tibial Peg Shelf in Congenital Dislocation of the Hip  
*J. Bone & Joint Surg.*, 1935, 17, 60

A shelf-forming operation is indicated in congenital dislocation of the hip when open reduction is accomplished and the acetabulum is too shallow, when, in older cases, the femoral head cannot be reduced, when, with usage, after closed reduction, the acetabulum proves to be inadequate, and when, in cases of congenitally inadequate acetabulum, the hip becomes painful during adult life.

This type of procedure with various modifications has given fairly satisfactory results. Its advantages are the ease and simplicity of performance of the operation. However, it has certain disadvantages. One is that the shelf may not be turned down sufficiently low. Another, that the reflected bone is sometimes unstable in its new position. A third, that postoperative muscle contraction tends to displace the femur upward, especially if it has been pulled down and if complete reduction has not been accomplished.

To obviate these disadvantages the authors formed a tibial bone-peg shelf in fourteen cases of congenitally dislocated or inadequate hips and five cases of pathological dislocations resulting from pyogenic coxitis.

While the number of cases is small and in most of them the time since the operation is too short for determination of the end results, the authors state that in cases treated by this operation the shelf formed is more firmly anchored and heavier than the shelf made from the ilium, weight extension and



Diagrammatic illustration of the tibial peg shelf operation

pin or wire fixation of the femur to the cast are not necessary, and the periods of immobilization and confinement to bed are materially shortened. Subsequent upward displacement of the shelf has never occurred.

The range of motion has not been all that could be desired, but, on the average, has been about as great as that obtained after the formation of an iliac shelf.

Disadvantages of the operation are that it is a more formidable procedure than the formation of an iliac shelf and requires two incisions. However, if one operating team removes the grafts while another exposes the hip, reduces the dislocation, and prepares the field, the time is reduced to approximately that required for the construction of an iliac shelf and there is little shock.

NORMAN C. BULLOCK, M.D.

# SURGERY OF THE BLOOD AND LYMPH SYSTEMS

## BLOOD VESSELS

Schumacher S. Arteriovenous Anastomoses (Zur Kenntnis der Arteriovenösen Anastomosen) *Arch. Klin. Chir.* 1934. 59 335-

Ordinarily an artery becomes lost in the capillary network from which the vena originates. In the capillary network the blood pressure is almost completely lost, and in the vena it decreases to the minimum. At very definite sites there occurs a sort of shunting, short-circuiting between the artery and the vena through one or several anastomotic vessels. These are modified arteries and are capable of complete closure. The ordinary arteries are capable of closure, even with maximal contraction of their vascularly arranged musculature. They are never obliterated completely. However, at certain sites there are arteries which, in addition to a ring musculature, possess also an internal longitudinal musculature and consequently are capable of closure. The longitudinal musculature is arranged in the form of cord-like bundles protruding toward the lumen (tubercular artery the primary branches of the digital arteries, the dermalis penis artery small branches of the thyroid artery and anastomotic vessels). Accordingly an anastomotic vessel may open and close. When it opens, the blood flows from the artery directly into the vena through the anastomosis which offers less resistance to it than the capillary network, and the corresponding capillary area is completely shunted out of the circulation. The arterial blood pressure is thereby transmitted to the ven and blood richer in oxygen reaches the vena. When stasis occurs, the column of blood in the vena can be pushed farther by this *vis-a-tergo*. It therefore appears evident that the chief factors are circulatory and heat-regulating mechanism which may check stasis in the circulation. This is indicated also by the sites of the arteriovenous anastomoses, which occur especially at the most extreme points of the body where stasis originates most easily as in the skin of the fingers and toes, especially the clucking extremities of mammals and birds, in the uncies of long-eared animals, at the tip of the snout, and in anastomotic vessels constituting direct communications between arterial branches and cavernous spaces. When these arteries open, the cavernous tissue is shunted into the circulation and erection results. When they close, the blood flows into the veins through the capillaries and the erectile body is shunted out of the circulation. Arteriovenous anastomoses are found also in internal organs. On examination one is impressed by the numerous sections through anastomotic vessels which show a

picture differing from that presented by ordinary cross-sections of arteries. Innermost is the endothelium. From this out and there follow several layers of round or polyhedral cells with large, round nuclei poor in chromatin. Through these round anastomotic vessels resemble gland ducts and are formerly considered to be such ducts. At the transition of an artery into an anastomotic vessel it is seen that the epithelioid cells constituting the inner wall of the anastomotic vessel are the same as the cells with nuclei that have become rounded and devoid of fibrils. As this epithelioid musculature is characteristic of an anastomotic vessel, such vessels may be recognized readily from the structure of the wall. In the dog, the epithelioid metaplasia of the muscle cells are demonstrable in different species. In the cynomolgus monkey the metaplasia is represented by only a slight modification of the musculature. In the dog, the epithelioid metaplasia is further advanced. In man it has reached its highest stage, the differentiation of circular and longitudinal muscle cells being no longer possible. As these cells have become polyhedral. The last of functional importance is that the vessels showing the described structure are capable of closure. Sometimes the lumen of the anastomotic vessel is seen completely closed and sometimes open. On section of the median sacral artery the median sacral vein sometimes closes immediately without filling of the capillaries in the vicinity and sometimes the capillaries fill up before the vein. I typically fully developed anastomotic vessels the epithelioid wall and the capability of closure are characteristic. The manner in which closure is characteristic occurs is still undetermined. Seemingly to rule out contractibility of the epithelioid cells in the absence of myofibrils and the polyhedral shape of the cells it is possible that the cells all up by the accumulation of water thereby closing the lumen in a purely passive manner. Attention should be called to the frequent occurrence of lamellar bodies in the vicinity of arteriovenous anastomoses. As these are apparently to be regarded as regulators of blood pressure the localization relationship between lamellar bodies and anastomoses may have functional importance. The small intestine has a short cut circulation which differs in different species. In this respect two groups of species are to be distinguished. In one group to which belong the rodents, the bat, and man, the short-cut circulation is located in the region of the villi. The artery of the villi divides first in the tip of the villi into 2 branches, one of which goes directly into the vena of the villi, thereby forming a anastomotic marginal arch,

and the other of which becomes lost in the capillary network of the villus. During the fasting state and also at the beginning of the injection only the marginal arch becomes filled, the capillary network remaining empty. During digestion, not only the marginal arch but also the capillary network becomes filled. In the other species group, that of carnivora and ungulates, the short cut circulation is located, not in the villi, but in the submucosa. Here there are numerous typical arteriovenous anastomoses in the region of venous nests, the "small venous bales." When the anastomoses open, the blood flows into the venous plexus and the mucosa is for the most part excluded from the circulation. When the anastomoses close, the villi are shunted into the circulation. Because of these direct communications between the arteries and veins the blood in the mesenteric and portal veins is under a relatively high pressure and receives a relatively large amount of oxygen. It is evident that there are mechanisms in the intestine which make it possible for sometimes large and sometimes small amounts of blood to pass through. It must be borne in mind also that arteriovenous anastomoses occur in the mesentery. In one instance the author was able to demonstrate them in the cat.

(E. HEMPEL)    LOUIS NEUWELT, M.D.

Frieh, P., and Levy A. Information Obtained by Arteriography in Certain Vascular Diseases of the Extremities (Renseignements fournis par l'artériographie dans quelques affections vasculaires des membres). *Lyon chir.*, 1934, 31, 660.

The studies reported were carried out at the Grange Blanche Hospital, Lyons, on the service of Lerche.

The authors state that they adhere to the technique of Dos Santos. They employ thorotrast as the contrast medium and have never found it to exert an unfavorable effect. The use of the Caldas radio-carrousel makes it possible to follow the medium from the arteries into the veins and thus obtain a clear picture of the vascular tree in its entirety. The application of a tourniquet to slow up the circulation is of aid, especially in exploration of the arteries of the foot.

The studies herewith reported were made in twenty-five cases of peripheral vascular disease. In all, the information obtained was found to be of value in the determination of the proper treatment. Among these cases were sixteen of arteritis and four with syndromes suggesting arteritis in which a positive diagnosis of arteritis could not be made on clinical examination. The former group included seven cases of atheromatous arteritis, four of the Buerger type of arteritis, two of frostbite, and one case each of diabetic arteritis, arteritis of rapid evolution, and arteritis of specific origin. The latter group consisted of one case each of scleroderma associated with Raynaud's disease, Volkmann's syndrome, traumatic osteoporosis, and painful amputation stump.

In three cases the contrast medium was injected into the aorta and in one case into the axillary artery above the clavicle. In all of the others it was injected into the brachial artery in the antecubital fossa for study of the vessels of the upper extremity and into the femoral artery below the inguinal ligament for study of the vessels of the lower extremity. In a number of cases the clinical symptoms permitted a probable diagnosis of arterial obliteration.

It is most important to know (1) the exact position and extent of the obliterated portion of a vessel, (2) the condition of the arterial tree in the region of the thrombosed trunk, and (3) the amount of collateral circulation.

Certain arteries are suitable for arterectomy and others are not. The former include the external iliac and femoral arteries and the latter the popliteal artery.

Occasionally, in spite of a sufficient collateral circulation, the condition of the entire main trunk is so poor that a high periarterial sympathectomy is to be preferred to resection. The danger of friability of the vessels and of the cutting of a rigid artery by a ligature must be borne in mind.

Arteriography shows not only the presence but also the nature of vascular occlusion. For example, in the cases of young persons it is difficult to differentiate clinically between an atheromatous condition of the arteries and Buerger's disease. Arteriography shows that in atheromatous disease the arteries are abnormally large and rigid and eventually look like a string of beads, whereas in Buerger's disease, the vessels are small and narrow, similar to those of a child. In certain cases of extensive ulceration or gangrenous plaques, arteriography shows the arteries to be permeable with the exception of the finest terminals. This is the picture in frostbite, in which excellent results are obtained by periarterial sympathectomy.

In diabetic gangrene the vascular lesions are very variable and their manifestations do not always correspond in site or extent of the obliteration. In fact, the arteries are often permeable into the gangrenous tissue. On the other hand, there are cases in which it is impossible to determine clinically whether the condition is atypical Raynaud's disease or arteritis with the Raynaud syndrome. In these also examination of the peripheral vascular system with thorotrast may solve the problem.

Arteriography is very valuable in determining where to approach a vessel which has become suddenly occluded by an embolus or is becoming occluded by a thrombus. It serves also to differentiate between intense spasm and organic occlusion. The authors report one case each of Volkmann's scleroderma secondary to Raynaud's disease in which arteriography with thorotrast showed the vascular bed to be open and the condition was alleviated by periarterial sympathectomy.

ADRIEN VERBRUGHEN, M.D.

## BLOOD; TRANSFUSION

Boggs, R. Spontaneous Hemophilia: a Report of Six Cases in Brothers. *Am J M Sc* 1934, 88 311

The author reports the occurrence of hemophilia in six boys of a family in which there were seven boys and one girl.

As the history of the mother's family through the fourth generation and partly through the fifth revealed no cases of bleeding and as a large number of male relatives studied were free from hemophilia, Boggs rejects the theory that the disease was concealed in the family for several generations and comes to the conclusion that it was either truly spontaneous or explained by illegitimacy.

HOWARD L. ALT, M D

Ré, J. Blood Transfusion. (Ueber Bluttransfusion). *Verh M f J Lepridisch* 1934, 95 1065

After a brief review of blood transfusion, the various blood groups, and the usual methods of blood-group determination and their disadvantages, the author presents a new method. Starting from an A or B group, every other blood group can be determined by this method. However the AB and O groups cannot be used for the starting point. The technique is as follows:

One-half cubic centimeter of blood from the ear or vein of a A or B group person is centrifuged to obtain the serum. One drop of the blood and 1 ccm of 3 per cent sodium citrate solution are then mixed in a small test tube. The same procedure is followed with the recipient's serum. Two samples are prepared for microscopic examination. A loopful of the known serum and unknown blood cells and a loopful of the unknown serum and known blood cells are mixed on separate cover glasses. The mixtures are then placed in vaselined-sealed hollow ground glass slides and placed in the thermostat for fifteen minutes. At the end of that time hanging drops are studied with low magnification. The agglutination possibilities are the following:

1. A (B) serum + unknown erythrocytes = no agglutination unknown serum + A (B) erythrocytes = no agglutination Group A (B)

2. A (B) serum + unknown erythrocytes = agglutination unknown serum + A (B) erythrocytes = no agglutination Group AB

3. A (B) serum + unknown erythrocytes = no agglutination unknown serum + A (B) erythrocytes = agglutination Group O

4. A (B) serum + unknown erythrocytes = agglutination unknown serum + A (B) erythrocytes = agglutination Group B (A)

(Continued) PHILIP SHAPIRO, M D

# SURGICAL TECHNIQUE

## OPERATIVE SURGERY AND TECHNIQUE, POSTOPERATIVE TREATMENT

Pohl, H. The Prevention of Pulmonary Complications in Surgery of the Stomach. Pre-Operative Vaccination (La prévention des complications pulmonaires en chirurgie gastrique. La vaccination préopératoire) *Bruxelles méd*, 1934, 15, 1

The study reported was carried out on the service of Gosset at the Salpêtrière, Paris

The author first discusses the relation to postoperative pulmonary complications of such factors as age, sex, previous pulmonary disease, the condition of the heart, arterial tension, lesions of the vagus nerve, the season of the year, general condition of the respiratory excursions. Exciting causes of such complications following operations for ulcer of the stomach include infection descending from the sinuses, nose, teeth, or tonsils and infection ascending from the area of the peptic ulcer, especially by way of the lymphatics of the diaphragm. Following a detailed discussion of the clinical, biological, and anatomical manifestations of acute exacerbations of peptic ulcer, Pohl states that operations carried out during an acute exacerbation are likely to be followed by pulmonary complications.

The symptoms of three types of pulmonary complications are discussed: typical pneumonia, pulmonary congestion, and embolic bronchopneumonia. In determining the incidence of pulmonary complications in non vaccinated patients operated upon during the period of a year, the author considered as cases of such complications all those in which there was a rise in the temperature exceeding 38.5 degrees C accompanied by dyspnoea and cough, with or without signs on auscultation.

In discussing vaccination for the prevention of pulmonary complications, Pohl describes the methods of others and then his own procedure.

Pohl first makes an intradermal test to determine whether the patient is sensitive to the bacteria usually associated with pulmonary complications. For this purpose he uses a polymicrobial vaccine from the Pasteur Institute. If the intradermal test is positive, he vaccinates the patient with the vaccine of Duchon according to the technique of Lapointe, giving  $\frac{1}{4}$ ,  $\frac{1}{2}$ , and then a daily injection of 1 c cm daily for eight days. A differential leucocyte count is made every day and another intradermal test on completion of the vaccination. The final intradermal test is usually negative. If it is positive, another series of injections of vaccine is given.

The proof of immunization is the marked polymorphonuclear reaction in the blood, the negative

intradermal reaction, and the low incidence of pulmonary complications in patients treated by vaccination.

The incidence of postoperative pulmonary complications in gastric surgery has been reduced by pre operative vaccination from 39.4 to 22.6 per cent, and the mortality of such complications from 9.6 per cent to 0. In a series of 104 cases without vaccination—in half of which operation was performed under ether anaesthesia and in the other half under a combination of local and spinal anaesthesia—pulmonary complications occurred more frequently when local anaesthesia was employed than when anaesthesia was induced with ether. Of the 41 patients who developed such complications, 9 died. Of 62 cases in which vaccination was done, local and spinal anaesthesia was used in 52 and ether anaesthesia in 10. Postoperative complications developed in 3 of the cases in which ether was used and 11 of those in which local anaesthesia was used, but were mild and in no case were fatal.

The author emphasizes that pre operative vaccination must not be regarded as a panacea against postoperative pulmonary complications. It must be supplemented by other procedures. The patient's general condition must be improved as much as possible and foci of infection in the sinuses, teeth, tonsils must be eliminated. Operation should be postponed until all clinical and biological signs of infection of the gastric lesion have disappeared. In Pohl's cases vaccine is given when necessary until the intradermal reaction is negative and the leucocyte count is normal. For two or three days before the operation gastric lavage is carried out with a dilute solution of iodine in water.

During operation, precision and gentleness are important. An extensive gastrectomy is to be preferred to the excision of ulcers or gastro-enterostomy in an infected area.

After the operation the patient should be kept warm and quiet. As the most important factor in the development of pulmonary complications is diminution of the respiratory excursions, the patient should not have a tight binder or be kept long in bed. Morphine should be withheld so far as possible after twelve hours, to sit on the side of the bed after thirty six hours, to sit in a chair after forty eight hours, and to get up the next day. Deep respirations should be encouraged. The use of inhalations of carbon dioxide has been proposed.

In conclusion the author emphasizes the importance of meticulous preparation of the patient, careful choice of the time for operation, vaccination when necessary, and getting the patient up early after operation.

ADRIEN VERBRUGGHE, M.D.



Buttiff, W. D. and Steele, R. F.: The Relationship of Infection to Postoperative Pulmonary Complications. *Arch Surg* 935, 30-34.

The authors report a study made in sixteen cases before and after abdominal operations to determine the relationship between postoperative pulmonary complications, infection, and diminished ventilation. Except for one appendectomy the operations were performed on the upper part of the abdomen. The anesthetic employed was ether alone or ether preceded by nitrous oxide and oxygen, with the exception of one case in which vertila was administered rectally.

Symptoms referable to respiratory disease were usually slight, but physical signs of pulmonary changes were present in all of the patients. Roentgenograms were taken before the operation and every two to four days for a period of two weeks after the operation. Elevation of the diaphragm was noted postoperatively in all of the patients. It was associated with dullness and rales at the bases of the lungs. Physical examination disclosed rales in nine cases, dullness in six, diminished breath sounds in four and bronchial breathing in six. Patchy shadows appeared in the postoperative roentgenograms in six cases and diffuse haziness in three. In four cases nothing more than an elevation of the diaphragm with corresponding physical changes was observed. In these, the diagnosis of hyperventilation was made. In two cases, definite pulmonary complications—lobar collapse in one and bronchopneumonia in the other—were found. In the ten other cases the signs were of an intermediate character. The authors believe that many of the physical changes would have been overlooked if special roentgenograms had not been made. The sixteen case histories are presented in table and four cases are reported in detail.

Repeated nose and throat cultures were taken. In the majority of the cases they were taken on three occasions before the operation and at intervals of from one to four days after the operation. The bacteriological findings are reported in detail. Three patients without pathogenic organisms in the pharynx before or after operation showed the least changes in the lungs. Of the thirteen patients with pathogenic organisms in the pharynx, eleven had postoperative pulmonary changes greater than the minimum. In seven cases a strain of pneumococci not recovered before the operation appeared postoperatively. G. DANIEL DELPRAI, M.D.

Leugenhager, K. The Problem of Pulmonary Embolism (Das Problem der Lungenembolie). *Helv. med. Acta*, 934, 35.

In all except two cases of fatal pulmonary embolism seen during the last four years the emboli were small, ranging in size from that of peas to that of the tip of the little finger. The patients would not have been saved by Trendelenburg operation as there was no mechanical obstruction. Moreover most of them died within few minutes, whereas in cases of

large pulmonary emboli the patient usually survives for from ten to fifteen minutes.

The author presents typical case histories. The theory that the sudden death is due to a reflex caused by irritation of the vessel wall by the suddenly entering embolus he believes is untenable as even powerful stimulation of the vessel wall such as that produced by the injection of sclerosing solutions into varicose veins, arteriography and the lodging of a fragment of the steel jacket of a bullet in a branch of a pulmonary vessel has no reflex effect. Foreman was able to sound the right auricle through the basilic vein on himself without causing side-effects, and in experiments in which Allen and McColl and Schumacher and John attempted to produce artificial pulmonary emboli in animals no evidences of shock were noted although pleural and mediastinal shock are well known phenomena in animals. The whip-like pain occurring in arterial embolism cannot be cited in support of the theory as it is caused by the secondary arteriospasm or ischemic spasm. Moreover the experimental researches of Odebrecht have shown that the arterial intima is insensitive to mechanical stimuli.

Leugenhager therefore believes that the sudden death should be regarded as a toxic reflex death. All blood clots, including the intravascular undergo dissolution by sterile lysis after certain length of time. This process sets free protein bodies which cannot be tolerated parenterally. The author cites the experiments of Hoffmeister and Voeller. He himself performed experiments with four samples of human blood. A sample of normal sterile human blood, a sample made slightly alkaline, and a sample slightly acidified were hermetically sealed and placed in the incubator for twelve days, and sample 1 normal blood was placed in the refrigerator. Actually therefore, blood coagula were employed. The incubation period chosen was twelve days because embolism usually develops in about that length of time. The autolysates were filtered, tested for sterility, and injected intravenously (1 cm.) in rabbits. It was found that severe disturbances of cardiac function are produced only by the normal or acidified autolysates. Ten seconds after their use, tachycardia developed with powerful dilatation of the heart, especially the right heart, and within one or two minutes the heart stopped. If 1 cm. of a 1/4 per cent solution of sodium phosphate were injected into the right heart immediately under pressure the heart soon recovered normal function. Although these reversible toxic effects were observed only twice in studies of ten specimens of normal human blood, Leugenhager believes they represent the phenomena occurring in clinical cases. He bases this theory on (1) the pulse and temperature changes which not infrequently precede the occurrence of embolism, (2) the dilatation of the right heart which is often found in internal thromboses and (3) the fact that even quite large pulmonary emboli often do not cause instantaneous cardiac death.

It is to be assumed that postoperative acidosis favors the formation of autolytic toxins. Arterial emboli produce no symptoms because the milieu in which they occur is alkaline.

Lenggenhager then replies to the criticisms of his hypothesis. He discusses particularly why reflex death does not occur in cases of hematoma and extensive thromboses without embolus or in those of large emboli occurring soon after operation. He states that in cases of hematoma there is a slow resorption which does not enter the direct blood passages. In extensive thromboses there is a slow diffusion, and in cases of large emboli the time is too short for autolysis.

Lenggenhager then gives practical instructions. The described procedure is the injection of from 100 to 300 c. cm. of a 2½ per cent solution of sodium phosphate by means of a large syringe into the right heart through a semi soft hollow probe filled with liquid which is pushed forward for about 32 cm. through the opened external jugular vein.

(FRANZ) HARRY A. SALZMAN, M.D.

Arnulf, G. *The Pathogenesis of Postoperative Parotitis* (Ou en est l'étude des parotidites post-opératoires? Essai de mise au point de leur pathogénie) *Revue de chirurgie*, Paris, 1934, 53: 680.

The author considers only parotitis occurring after an operation at a distance from the parotid glands—an abdominal operation for instance—in which there is no infection of the mouth or parotid region and the trauma of the operation was apparently the only cause of the condition. He concludes that the infection in such cases ascends through the duct. As the parotid opens into the mouth, which is a very septic region, ascending infection may take place just as in the kidney or pancreas. The mouth contains all the bacteria that are found in parotitis. The organisms most frequent in postoperative parotitis are the staphylococcus aureus, streptococcus, and pneumococcus. When there is an infection at the site of operation, the micro-organism in the parotid is usually different from that found in the operative wound.

Arnulf reports experiments on dogs which showed that parotitis may result from arrest of parotid secretion and that arrest of parotid secretion may be caused by operative trauma. As a rule the secretion of saliva is increased during operation and slowed at the end of operation. On the first post-operative day the mouth is very dry. The secretion of saliva is reduced by reflexes, dehydration, ether anesthesia, morphine, and the absence of movements of mastication. Among the factors predisposing to parotitis are an orifice or duct smaller than normal, a greater reflex inhibitory action from the peritoneum to the salivary gland, and a more abundant buccal flora than normal. As these factors are rarely combined in the same case, postoperative parotitis is rather rare.

Postoperative parotitis is best prevented by the avoidance of unnecessary trauma during operation,

the administration of abundant fluid before and after the operation to prevent dehydration, hygienic treatment of the mouth, and the administration of stimulants to salivary secretion when the mouth is dry.

AUDREY GOSS MORGAN, M.D.

## ANTISEPTIC SURGERY, TREATMENT OF WOUNDS AND INFECTIONS

Loehr, W. *Treatment with Cod-Liver-Oil Ointment, With and Without a Plaster Dressing, in Cases of Fresh Wounds, Burns, and Phlegmonous Inflammations* (Ueber die Ichertransalbenbehandlung—mit und ohne Gipsverband—bei frischen Verletzungen, Verbrennungen und phlegmonösen Entzündungen) *Zentralblatt f. Chirurgie*, 1934, p. 1686.

Loehr reports on three and one half years experience with cod liver-oil ointment in the external treatment of wounds. His clinical experiences were supplemented by studies of the effect of cod liver oil on wound surfaces.

Most oils, even though not sterilizable, are nevertheless free from bacteria. Cod liver oil belongs to this group. Bacteria are destroyed in it even if they are added in large numbers. Moreover, experience has shown that very large amounts of cod liver oil applied to large wound surfaces do not produce toxic phenomena.

Since cod liver oil in fluid form does not adhere to wounds satisfactorily, an indifferent ointment component was mixed with it. This combination is not inferior in effectiveness to the raw cod liver oil. With melting of the cod liver oil ointment, the oil penetrates into all crevices of the wound, abundant granulation tissue forms as in the Bier chamber, and the epithelium is stimulated to grow. Even in cases with enormous wound surfaces, Loehr has never been compelled to transplant skin in the last three and one half years.

The invasive power of the bacterial flora of the wound is very markedly inhibited. It is important to avoid disturbing the wound any more than is absolutely necessary. The use of drains and gauze should be omitted if possible, and changing of dressings should be limited to the minimum. In some cases an unperforated occlusive dressing of cod liver-oil ointment and plaster may be applied to advantage over the layer of cod liver oil.

Wounds that have been roughly contaminated with soil and highly infected wounds are never treated primarily with cod liver oil ointment. The cod liver oil ointment and plaster dressing is indicated for chronic wounds with large tissue defects of the most varied types and after phlegmonous processes and gas gangrene, but particularly for burns.

The results of this treatment are shown by seven-teen illustrations. The lesions included recent industrial injuries of the fingers, a gunshot wound of a finger, severe burns, a large roentgen burn, severe crushing injuries of the forearm and elbow, severe compound fractures of the leg with large defects in

the soft parts and bones, a severely contaminated crushing injury of the brain with skull and soft-part injury, and loss of substance of the upper extremity from gas oedema.

The effectiveness of cod liver oil is attributed to its content of Vitamins A and D.

(Reviewed) JOHN H. GARLOCK, M.D.

Clark, A. M., and Cruickshank, R. The Treatment of Burns. *Lancet* 1935, 18, 301.

During the past 15 years bacteriological examinations have been made of swabs taken from the abraded surfaces of severe burns in cases admitted to the burn wards of the Glasgow Royal Infirmary. It has been found that in the cases of patients admitted to the hospital within twenty-four hours after the injury the majority of burns are infected at the time of their admission. Later, generally within from twenty-four to forty-eight hours, cultures from the burn yield a profuse bacterial flora in which streptococcal hemolysis is usually the predominant organism. This bacterium is not infrequently present in almost pure culture and seems to find the large abraded area deprived of its protective epithelial covering particularly favorable environment. Because of experimental evidence that tannic acid acts slowly on cultures of streptococcal hemolysis, the authors advise the use of 5 per cent tannic acid solution to which is added a 20 per cent solution of proprietary halogen derivative of cyclol. They apply this as moist dressing.

(Reviewed) S. MURRAY SUTHER, M.D.

Dunbar, J. A Review of the Burn Cases Treated in the Glasgow Royal Infirmary During the Past Hundred Years (1822-1924) with Some Observations on the Present-Day Treatment. *Glasgow M. J.* 1934, 22, 26.

Dunbar reviews 9,074 cases of burns treated in the past hundred years. During the past fifty years the Glasgow Royal Infirmary has had burn wards. The number of cases seen is increasing. The increase is due to (1) increase in the population, (2) increasing popularity of hospitals, (3) changes in social and economic conditions, and (4) industrialization.

In the 3,427 fatal cases reviewed, 8 per cent of the deaths occurred in the first twelve hours, 26.5 per cent within twenty-four hours, and 65.5 per cent within forty-eight hours. The mortality then fell to 8.5 per cent on the third day and 4.7 per cent on the fourth day and thereafter gradually decreased until the fourteenth day when it showed slight increase. The greatest number of deaths occurred between twelve and twenty-four hours after the accident. Only 8.5 per cent occurred within the same limit usually associated with the beginning of catatonia. Dunbar is of the opinion that if the obviously fatal cases are eliminated, the percentage of deaths due to acute toxæmia is very small. He does not believe that acute toxæmia is due to the absorption of broken down proteins, being inclined rather to attribute the phenomena associated with the so-

called toxic burn shock to infection. In his experience, burns of the perineum of male infants are often rapidly fatal regardless of their severity. He thinks this fact is explained by irritation of the rectum.

The local treatment of burns during the past hundred years may be divided into two periods before and after the introduction of antiseptics, that is, before and after 1868. In the pre-antiseptic period, two methods were employed, the dry and the oily. The antiseptic era can be divided roughly into three periods: (1) the carbolic acid period (1868-1883), (2) the sodium bicarbonate period (1886-1909), and (3) tannic acid period. These represent three theories as to the principal causes of early death: (1) that organisms are responsible, (2) that organisms are not the sole cause, and (3) that protein decomposition, not infection, is the cause.

Because of the recent popularity of the tannic acid treatment, it is interesting to note that this form of therapy was tried by Denon in 1853 but apparently did not become popular. That time Dunbar has been disappointed in the results obtained with the tannic acid method. Third degree burns, but he believes that this treatment is satisfactory for first and second degree burns. The principles governing the general treatment in cases of burns have been the same throughout the last hundred years: elevation, stimulation, and the relief of pain.

The importance of an abundant supply of fluids has been recognized throughout that time. Blood letting is in vogue in the earlier years and has been restricted by sanguinization transfusion advocates. The general treatment in the burns ward in the Glasgow Royal Infirmary in the past year has been as follows:

A bath at temperature between 100 and 102 degrees F. is given and the patient then put into shock room where the temperature is maintained between 80 and 90 degrees F. In many cases, however, the hot bath must be omitted. The shock room in the infirmary is small one with a capacity of only 12 beds. Its temperature can be kept at any temperature desired.

Morphine is only given if necessary.

3. Strypchnine, 50 gr. (1/20 gr. is given to children) followed by whiskey at intervals of from 16 to 24 hours as indicated. When shock persists, camphor oil is injected.

4. The diet consists of liberal quantities of fluid containing sodium bicarbonate and glucose. If the patient is sick, saline solution is given by rectum. A soap enema followed by the continuous rectal administration of saline solution has yielded good results.

5. Elevation is procured with magnesium sulphate in the cases of adults and with castor oil in the cases of children. Eutrope is given every four hours to keep down a pyrexia. Antiseptic solution of the kidney.

6. Antistreptococcal serum (acristanin) is given to all children, to 12 patients with extensive burns, and to 22 patients whose temperature rises above 100 degrees F. within 24 to 48 hours.

7 When the patient recovers from shock every care is taken to keep him from becoming chilled during his removal into the ward. The temperature of the shock room is reduced to that of the wards. Gamgee jackets are applied to babies, and extra blankets are given to all patients.

8 In cases of severe burns the patient's position is changed frequently.

Pulmonary complications and sepsis are the most common complications. Duodenal ulceration has been recorded in only 10 cases and Dunbar believes that, at most, it has not occurred in more than 30 cases. He doubts that the scarlatinal rash often observed is true scarlet fever. It has not been observed since the routine administration of anti-streptococcal scarlatinal serum. Tetanus and nephritis have been rare. STANLEY J. SEFGER, M.D.

Miller, R. H., and Rogers, H. The Present Status of Tetanus, with Special Regard to Treatment. A Report of Further Cases from the Massachusetts General Hospital. *J. Am. Med. Ass.*, 1935, 104: 186.

The authors report a gradual decrease in the mortality of tetanus since 1896 from 80 to less than 47 per cent.

They state that the prophylactic injection of anti-toxin (1,500 units) is indicated in cases of deep or puncture wounds that may be contaminated. In unusually suspicious cases this should be repeated once or even twice at intervals of ten days.

When possible, the wound should be debrided and kept open.

After the onset of tetanus every effort should be made to conserve the patient's strength by the maintenance of nutrition and fluid balance and the combating of muscle spasms.

Tribrom ethanol is a useful drug for the control of spasms.

As soon as the diagnosis is made, serum should be given intravenously or intramuscularly or by both methods in daily doses of from 20,000 to 80,000 units up to a total of 300,000 units.

In hypersensitive subjects the process of desensitization must be instituted as soon as possible.

There are no theoretical or practical grounds for the recommendation of the intraspinal administration of antitoxin.

Serum reactions may be expected in about one third of all cases treated. The immediate reactions occur as a rule from two to five days, and the delayed reactions from ten to fifteen days, after the initial dose of serum. In the cases reviewed there were no fatal reactions. JOHN H. GARLOCK, M.D.

Ralga, A. The Role of the Organic Constitution in the Evolution and Treatment of Furunculosis (Le rôle du terrain organique dans l'évolution et le traitement de la furunculose). *Bull. et mém. Soc. d' chirurgiens de Par.*, 1934, 26: 530.

The author states that furunculosis is sometimes serious. Occasionally it is complicated by sepi-

cæmia. The causative organism is the yellow or the white staphylococcus. The condition may be circumscribed or diffuse. The following five clinical types may be recognized: (1) true recurrent furunculosis, (2) accidental furunculosis in which an increase in antibacteriophages is produced by an intercurrent disease such as coryza, (3) recurrent accidental furunculosis due to successive contaminations from other lesions or other people, (4) recurrent furunculosis with hyperglycæmia in which there is a definite disturbance of carbohydrate metabolism, and (5) severe furunculosis.

Ralga is of the opinion that furunculosis is always associated with definite constitutional changes, chemical and immunological. The chemical change is hyperglycæmia either actual or potential, and the immunological change an overproduction of antibacteriophages. He therefore believes that the treatment should be directed first toward correction of the hyperglycæmia by regulation of the diet and the administration of insulin, and toward combating of the antibacteriophages by autohemotherapy. After elimination of the antibacteriophages the d'Herelle phenomenon can take place normally and bacteriophages may be used successfully.

WILLIAM C. BICK, M.D.

## ANÆSTHESIA

Heard, A. M. Clinical Observations on the Use of Evipan. *Canadian M. Ass. J.*, 1934, 31: 617.

Evipan, a barbituric acid derivative, is the newest intravenous anesthetic. Although its use is limited, its action is spectacular. Within from sixty to seventy seconds after its injection, full surgical anesthesia is established with relaxation sufficient for almost any procedure which can be completed in from five to twenty minutes. At the end of that time the patient regains consciousness with amazing rapidity, and after from twenty-five to thirty minutes is usually entirely rational.

At the present time evipan must be regarded as chiefly a substitute for nitrous oxide in minor surgery. In the case of the patient undergoing a minor operation at home or in a small hospital it provides comfort, safety, and convenience such as were not possible heretofore. All of the author's patients who had been subjected to inhalation anesthesia previously favored evipan when they were questioned concerning their comfort during the induction of, and recovery from, the anesthesia. Many persons have a horror of breathing gas or vapor of any kind, and others refuse to permit an operative procedure under local or spinal anesthesia. Evipan anesthesia is a welcome time saver to the busy surgeon as its use reduces delay between cases, the technique for its induction being simpler than that required for local or spinal anesthesia and relaxation occurring much more quickly than following the administration of ether or nitrous oxide. However, as it has been employed for only a short time it cannot yet be designated the ideal type of anes-

## INTERNATIONAL ABSTRACT OF SURGERY

thea. Moreover, it has disadvantages. There is the mechanical difficulty in giving intravenous injections to children, nervous adults, and obese patients with small veins, and there are persons who have a greater fear of the needle than of the mask.

Evipan is used in a 0.5 per cent solution of the white crystalline powdered drug in distilled water. If the solution is injected intravenously, the rate of 1 cm in ten seconds, it will be found that the patient is still able to talk normally at the end of twenty seconds. After thirty seconds, he is confused or incoherent but entirely calm and peaceful. After forty seconds, he goes to sleep in the middle of a word, usually with a yawn. After fifty seconds, respiration gradually becomes more superficial, but there is practically no change in the color, pulse, or blood pressure. After sixty seconds the patient is in full third-stage anesthesia and ready for operation. Immediately following the loss of consciousness, respiration becomes gradually more superficial. However, it remains regular and of normal tidal volume. After ten breaths, respiratory rhythm until, after possibly ten breaths, respiratory movement is scarcely perceptible. There may even be a pause equal to two or three breaths. The movements then gradually deepen again until full volume is reached at the point corresponding to general relaxation and differs from anything seen in inhalation anesthesia. The color remains unusually good, even if the pause covers a period equal to several respirations. As with inhalation anesthesia, there is a period of complete relaxation. If the type of intervention permits the performance of operative procedures without complete relaxation, this time may be utilized as there is no pain and no recollection of the operation. In the author's experience, full relaxation including that of the jaw muscles with absence of cough and gag reflexes has lasted for from ten to twenty minutes. Total unconsciousness with relaxation has been more uniform for from ten to twenty minutes. Thereafter the patient has quietly as in natural sleep about five minutes and then rolls over, opens his eyes, and looks around. Sometimes he moves about rationally once, but more often he moves about for a few moments, appears dazed, and is not rational for four or five minutes. Occasionally in the cases of very nervous patients there may be hysterical crying, moaning, or shouting. Except for this group, recovery is complete from twenty-five to thirty minutes after the beginning of the injection.

In the author's cases of bed patients the nursing care was as easy as less supervision was needed than in cases in which either was employed. When Evipan is to be used in the office or as an outpatient clinic, recovery room must be provided. The majority of ambulatory patients will be able to walk home from the beginning of the operation. A waiting for an hour or more but experience dosage and the

avoidance of sedatives will reduce slow recoveries to the minimum. The entire absence of nausea, except in mouth cases, is noteworthy.

The technique of the administration of Evipan is as simple as that of any intravenous injection. The powder is sufficiently soluble to allow preparation of the solution directly in the ampoule and 0.5 cc syringe. Because of the brevity of the period of anesthesia, all preparation of the field and draping should be completed before the injection. That this may be done with practically no danger of later contamination is a further proof of the smoothness of the induction. When the surgeon is ready to make the incision, the assistant begins the injection, leaving the anesthetist free to watch the patient and determine the speed of the injection and the quantity of anesthetic to be used. In an emergency the surgeon may make the injection and then proceed to operate, delegating a nurse to hold the patient. The rate of injection seems very important. The rate of injection has been prevented the tremor and convulsions which have been attributed to too rapid injection by injecting at the rate of about 1 cc in ten seconds. A slower rate is more difficult to maintain, but allows more accurate observation of the reactions. It may eventually become desirable to use a more dilute solution to spread out the stages.

Evipan is so rapid in its action that its administration may be continued or stopped at any time, depending upon signs of the desired effect. Its use is therefore free from the danger of intravenous medication which has been injected, it cannot be reversed. It is one of the few drugs that can be recovered to work, the most satisfactory method of determining dosage. The author regards the dosage recommended by the manufacturer—approximately 15 mgm per kilogram or 7 mgm per pound of body weight—as a maximum standard to be used with caution rather than a definite standard to be used in each case. However, as the fatal dose determined by animal experiments is said to be from 45 to 50 mgm per pound, the margin of safety is wide, particularly as respiratory failure precedes stoppage of the heart. The author prefers to judge the patient's reaction to the drug by his response to the injection of enough to induce unconsciousness. In general, he considers the sleep-producing dose to be about one half the full dose. For example, he believes that the patient who goes to sleep rapidly when 3 cc are administered will probably be relaxed after the dose by weight may be considerably more. The continuation of the full eight dose in the case of such a patient would inevitably lengthen the period of recovery without necessarily adding the corresponding increase in the operating time. T. Increase the length of the relaxation time the author uses the fractional method of injection. In this method the operation is begun at the usual

time with the needle left in place, and if relaxation becomes insufficient after a few moments, a further 0.5 c cm is given and repeated at intervals throughout the operation. This is probably the ideal method since it allows completion of the work if unexpected complications prolong it beyond the estimated time. In the manner described three times the sleep producing dose has been given without causing undue depression although recovery was delayed, requiring two hours from the beginning of the induction of the anaesthesia.

Pre-operative sedatives should be used with caution and only after some experience has been gained in the use of evipan. Morphine seems to add materially to postoperative depression without increasing the period of relaxation sufficiently. In most of the author's cases full doses of codeine or morphine were given within an hour after operation without causing trouble. It appears unwise to use any other barbiturate before or after evipan.

Postoperative complications were entirely absent in the cases reviewed. No evidence of systemic damage was observed. In four cases in which a chemical study of the blood was made no significant change was found. No tissue damage occurred at the site of injection even in five cases in which leakage of the solution occurred. Of the three

patients who showed the slowest recovery one was over weight, one was under-weight, and one had a low basal metabolism. On the basis of experience with avertin such a reaction was anticipated in each as the contra-indications to the two drugs seem very similar.

In a series of thirty cases the author found evipan to be a satisfactory anaesthetic without the use of preliminary sedatives or a supplementary anaesthetic for the incision of abscesses, dilatation and curettage of the uterus, the insertion of radium into the cervix, haemorrhoidectomy, the extraction of teeth, tonsillectomy, the exploration of an infected abdominal wound, and the control of convulsions in tetanus. In the cases in which its use was most satisfactory recovery was, on the whole, as good as, or better than, that from uncomplicated nitrous oxide anaesthesia of about twenty minutes' duration, and in the cases in which the results were poorest they were considerably more satisfactory than those that could have been expected from the use of ether for the same patient and the same operation. In four months' trial the drug has fallen short of the author's expectations in some respects, but has exceeded them in others. Heard believes there are still more fields in which it will be found of value.

MAURICE MEYERS M.D.

# PHYSICOCHEMICAL METHODS IN SURGERY

## ROENTGENOLOGY

Hirsch, I. S.: Examination of the Heart by the Roentgenkymographic Method. *Br. J. Radiol.* 1914, 7: 743

Observation of cardiac movements by means of fluoroscopy or cinematography has been rather unsatisfactory for practical purposes. The roentgenkymographic method, which is essentially roentgenography through a slit diaphragm placed close to the object in movement on moving film, seems to be a promising method for the study of cardiac action. In this procedure the outward lateral diastolic and inward medial systolic movement of small portions of the cardiac contour disclosed in the slit are recorded in the form of a wave on the film which moves at right angles to the direction of the slit. The peak of the wave indicates the position of the particular point of the surface of the heart in maximum diastole and the deepest point of the trough of the wave the position of the particular point of the surface of the heart in maximum systole. By an analysis of the contour, amplitude, and duration of the waves of a particular part of the cardiovascular shadow and a comparison of the time and space characteristics, the character of the movement of that part may be determined and correlated with the movement of other parts.

The technique used is analyzed in detail as regards the spacing and width of the slit, the rapidity of the film motion, the film target distance, the focal spot of the tube, the rotation of the grid, and the applicability of the examination with the patient in the horizontal and vertical positions. The apparatus should be arranged for both moving film and moving grid, and the complete kymographic examination of the heart should include a postero-anterior view, postero-anterior second oblique view, and postero-anterior first oblique view with the esophagus filled with a contrast bolus. The technique used by different workers in connection with some of the factors mentioned is tabulated. The kymographic record may be studied by itself or in association with electrocardiographic or phonocardiographic records.

Because of the difference in the techniques used by different workers, there is as yet no uniformity in methods of analyzing or reporting the findings. The author briefly describes and interprets the results obtained by others and himself. The kymographic wave shows the character, direction, speed, and regularity of the movement of any particular part of the heart. These depend upon the contraction phenomena, the mass (thickness) and elasticity (tension) of the contracting muscle and the nature of the surrounding tissue.

The kymogram differs from the ordinary roentgenogram in that it is crossed by regularly-spaced lines which divide the film into a series of frames. Each frame shows a definite wave or waves corresponding to the cardiac movement of the contour, and the waves differ according to the character of the movement of the particular part of the heart. The cardiac shadow shows variations in density due to the pulsating effects in diastole and systole. The usual pulmonary markings appear as wavy lines, the ribs form band-like rectangular shadows which jut into the pulmonary field, and the diaphragmatic curves are replaced by beads in a step-like formation.

Characteristic waves are found for different portions of the cardiac contour. Ventricular waves consist fundamentally of a sharp, smooth, forward moving limb representing systole followed by a bent limb representing diastole. Auricular waves are characterized by simpler structures and smaller amplitude than the ventricular waves. They consist of a low slowly ascending limb (diastole) and a relatively short rapid limb (systole). Vascular waves produced by the aorta consist of a slow long descending limb (slow movement) and a sharp, steep, almost horizontal out and thrust. The pulmonary wave is similar except that its peak is blunted or flattened.

The method described makes it possible to determine with accuracy the extent and direction of the movement of the various portions of the heart, the relation of the movement of the various parts to each other, the movement of the heart as a whole, the boundary points between the various chambers, and the points of maximum and minimum deviation. Thus, the placement of the points used to measure the cardiac diameters becomes more precise and the gross inaccuracies of present-day methods of roentgenographic cardiac measurement may be corrected.

In the study of the abnormal heart, roentgenkymography may reveal deviations from the normal due to disturbances of rhythm or intrinsic changes in the musculature. Anomalous dilatations of parts of the heart or aorta may present findings of aid in their detection. Changes resulting from valvular defects may produce abnormal vibrations and variations in the chamber movements which may be portrayed graphically. The procedure may be of value in demonstrating extracardiac influences which modify the anatomical relationship of the heart and the intrathoracic pressure changes.

The kymogram is of aid in the differential diagnosis of lesions which produce distortions of the mediastinal shadow. Tumors, subasternal thyroid, and cysts usually show no movement. Aortic aneurysm shows a deformity of the median shadow due to aortic

dilatation presents definite aortic waves and density changes in the waves. The transmitted pulsations show as waves without density changes.

Roentgenkymography may be employed also to study the action of drugs on the heart muscle.

In conclusion the author says that, according to the data already obtained, many uses will be found for roentgenkymography and it will be of great assistance in the solution of numerous difficult problems in the field of cardiodynamics.

The article is copiously illustrated by roentgenkymograms with complete descriptions which constitute a valuable supplement to the text.

ADOLPH HARTUNG, M.D.

**Friedman, M., and Rosh, R. Protracted External Irradiation in the Treatment of Neoplasms of the Mouth and Throat. A Comparison of the X-Rays, the 5-Gm Radium Pack, and the 100-Mgm Radium Pack. *Radiology*, 1935, 24, 7.**

This is a report of a two-year clinical study dealing with protracted external irradiation as applied to the upper respiratory tract. Three types of rays were used to ascertain the relative value of each. The objects of the study were: (1) to compare high voltage X-rays with gamma rays from the clinical standpoint, (2) to determine the optimum number of days for the administration, (3) to determine the optimum number of hours per day, and (4) to ascertain the indications for interstitial irradiation. The three techniques used were as follows:

1. X-ray irradiation at 200 kv., 4 ma., filtration by 2 mm. Cu and 1 mm. Al, a distance of 60 cm., a portal measuring 10 by 15 cm., and a duration of treatment ranging from eighteen to twenty-eight days. A forty-five-minute treatment producing 200 r was given to each of two areas every day, one in the morning and one in the afternoon. The total dose was from  $3\frac{3}{4}$  to 5 skin erythema doses or from 3,400 to 4,400 r to each of two portals.

2. Irradiation with a 5-gm radium pack with filtration by 6 mm. of lead, a distance of 6 cm., a portal measuring 8 by 10 cm., and the delivery to one area only each day of a dose of 5,000 mgm.-hrs., amounting to 30 per cent of a skin erythema dose. The time ranged from twenty-eight to thirty days. The total dose was from 50,000 to 60,000 mgm.-hrs. or from 3 to  $3\frac{1}{2}$  skin erythema doses to each of two areas. The grand total was from 100,000 to 120,000 mgm.-hrs.

3. Irradiation with a 100-mgm radium pack with filtration by 2.5 cm. of platinum, a distance of 60 cm., a portal measuring 7 by 9 cm., and the administration of a daily dose of 2,400 mgm.-hrs. to one or both sides of the neck, depending upon whether one or two packs were used. The time ranged from eighteen to twenty-five days, and the total dose from 43,000 to 60,000 mgm.-hrs. to each area.

In the use of the X-rays the Coutard technique was followed. A constant technique was used for purposes of comparison although occasionally

efficiency was sacrificed thereby. The technique employed in the use of the 5-gm radium pack was designed to produce as nearly as possible the biological dose delivered by X-rays. Expediency required that the distance employed in the use of the radium pack be such that the depth dose was smaller—about one-third that of the heavily filtered X-rays. In the case of the 5-gm pack, 17,500 mgm.-hrs. delivered in three and one-half hours at one sitting produced a threshold erythema. Daily treatments therefore lasted one hour, 5,000 mgm.-hrs. or 30 per cent of the skin erythema dose being given to one of two portals each day. Thus, each portal received an average of 2,500 mgm.-hrs. a day. In the use of the small radium pack the factors of the treatment with the 5-gm pack were duplicated except that the quantity of radium used was different and the tubes were placed within the slightly smaller port. The technique employed in making the applications is described in detail. In the use of the small pack it was found that while the optimal duration of treatment was twenty-eight days, the pressure of the pack was prohibited by the epidermitis after the twenty-third day. Clinical observations were made and graphically recorded three times a week.

With regard to the duration of the treatment the authors state that in the use of the X-rays with an effective wave length of 0.16 Å and a half-value layer of 0.92 mm. Cu, a single dose produced an erythema which reached its peak in from sixteen to eighteen days. If these rays were administered at the rate of 200 r per day, the reaction was so intense by the sixteenth day that discontinuance of the treatment became necessary. Therefore it is postulated that from sixteen to eighteen days is the optimum time of protracted external irradiation with rays of this quality.

In the use of X-rays with a wave length of 0.11 Å produced according to the Coutard technique and a half-value layer of 1.8 mm. Cu, the optimum duration of treatment was from twenty-one to twenty-three days. This finding agrees with the observations of Coutard, permitting the conclusion that the most effective type of protracted external irradiation is that which will produce an epithelitis and an epidermitis of second-degree intensity in which the epithelitis appears and terminates from five to seven days before the epidermitis. It is claimed that any irradiation administered later than the customary three or four weeks is directed at a tissue which is capable of not only resisting the destructive effect of the rays but also of undergoing reparative fibrosis while under bombardment. Therefore, increasing the total dose much above 800 r when treatments have been unavoidably extended beyond twenty-one days does not seem to influence the response of the tumor. On the other hand, if the duration of the treatments is too short there is a resulting increase in the severity of the epithelitis and epidermitis which necessitates reduction of the total dose administered.



In the use of radium gamma rays of an effective wave length of 0.1 A.U. with a half value layer of 1.5 mm. of lead and a distance of 6 cm. threshold erythema will be produced with a dose of 17,500 mpm. hrs. The latent period varies from four to six weeks. The destructive phase for gamma rays lasts for from twenty-eight to thirty days, after which time the tumor becomes markedly resistant.

The tumors studied included all types of carcinoma of the mouth and throat of varying degrees of malignancy. It was found that many were not completely destroyed by the external irradiation and required interstitial treatment. Following protracted external irradiation the tumor bed is modified to such an extent that it cannot tolerate interstitial irradiation as well as the non-irradiated tissue. When such areas are treated by interstitial irradiation they often fail to heal spontaneously and hence within the range of the interstitial irradiation breaks down with prolonged osteomyelitis. It was found that if a lesion shrank 5 per cent in from fourteen to sixteen days after the onset of the treatment, it usually disappeared completely under the influence of external irradiation alone. When the shrinkage was less than 5 per cent, at the end of that time the external irradiation was terminated and interstitial irradiation was administered as soon as the condition of the mouth permitted. As a rule only a small dose of interstitial irradiation was required to destroy the remaining tumor, but when the interstitial irradiation was delayed five or six weeks a much larger dose as necessary for the same volume of tissue as at the end of that time the neoplasm had become more radioresistant. The study demonstrated that the problem of interstitial irradiation is important. It was found that external irradiation rarely eradicates the more common resistant carcinomas or advanced lesions. Residual tumor must be destroyed by interstitial irradiation or electrocoagulation or both.

With regard to the duration of the daily treatment the authors state that the ideal irradiation is an irradiation administered continuously for ten to four hours a day over the longest effective time period. The small 100-mgm pack meets this ideal by giving in twenty-four hours approximately the same dose as is given by the 5-gm pack in one hour. The authors present tables showing that the small pack giving a dose of 45,000 mpm-hrs at each reex produces slightly less intense epithelitis but a more intense epidermitis than the large pack giving a dose of 55,000 mpm-hrs over a similar period of time. They state that from 3 to 3½ skin erythema doses of gamma rays delivered by the large pack are required to produce the reactions and results produced by from 5 to 7½ skin erythema doses delivered by the small pack. Therefore the small pack will produce biological effect of the same degree as the large pack with only 80 per cent of the dose.

The authors' findings and conclusions are summarized as follows:

In comparing the effect of X-ray and radium gamma rays according to the technique used no significant difference in the effect of these rays upon the tumor was noted. It required 4.5 skin erythema doses of X-rays to produce the effect of 3.5 skin erythema doses of gamma rays.

The erythema from gamma rays appears later and is more prolonged than that from X-rays. Gamma radium rays produce a more profound effect upon the normal tissues around the tumor which renders subsequent interstitial irradiation less well tolerated.

3. The duration of the period of administration is the most important single factor in protracted external irradiation. Since each type of neoplasm has its own rhythm of response, the attempt should be made to parallel this rhythm with suitable time duration for treatment. A delicate adjustment of these two factors is essential for protracted irradiation.

4. The double small 100-mgm pack producing continuous irradiation for twenty-four hours a day is an efficient therapeutic medium which closely rivals the 5-gm pack. A. JAMES LARSEN, M.D.

Craver, L. F. and MacComb, W. R. Heublein's Method of Continuous Irradiation of the Entire Body for Generalized Neoplasms. *J. Neoplasia* 1934, 3: 654.

The Heublein, in which continuous irradiation of 4 patients was possible was established in May '33, but because of economic conditions its use was discontinued in May '33. A Coulomb tube operating at 85 kv and 5 ma. as an anode that all 4 beds received unobstructed irradiation. The filtration generally employed, that obtained with a lam of copper resulted in an intensity of 7 per hour for the ear bed and 9 per hour for the far bed. The distance from the target of the ear beds was 54 meters, and that of the far beds, 73 meters. The voltage of 85 k. and the current of 5 ma. are regarded as optimum for satisfactory continuous operation, one to be rendering service for 748 hours.

In addition to the ward, there are rooms directly beneath the table in which it is possible to treat patient intermittently at a distance of 30 cm. Sixteen patients who required a large field for treatment were treated by this intermittent method.

During the period of two years, 44 patients received continuous irradiation in the Heublein, and in 37 cases, the Heublein treatment as the only form of irradiation given. Eight five of the patients had received local irradiation previously and in 35 cases local irradiation as used during or after the Heublein treatment. The dosage was small during the early days of the treatment, but in certain cases was gradually increased to from 50 to 100 per cent of the skin erythema dose. Irradiation sickness practically never occurred, and no evidence of erythema or alopecia as noted. Lymphedema was found almost routinely and anemia in some of

the cases. During the first few months detailed studies were made not only of the blood picture but also of the chemical constituents of the blood, the icterus index, the findings of fragility tests, and the basal metabolism. No significant changes were found in the chemical constituents of the blood. The blood cell and platelet counts were always watched carefully.

The radioresistant group of 25 cases included such conditions as mammary, prostatic, ovarian, renal, testicular, and tonsillar carcinoma. In this group the treatment was of only slight value except in a case of metastatic ovarian psammocarcinoma which seemed to show some regression.

In the radiosensitive group of 109 cases were such conditions as Hodgkin's disease, various types of leukaemia, lymphoid tumors, multiple myelomata, and Wilm's tumor. All but 6 of the 54 patients surviving showed definite improvement and have survived for from three to twenty-four months since the beginning of the treatment. Of those who died later, 17 showed palliation. Thus, of this group, 60 per cent showed appreciable improvement and 44 per cent were benefited and are still living. Contrary to the usual results obtained with local irradiation, patients with chronic lymphatic leukaemia seemed to respond better than those with myeloid leukaemia. Such patients should be given relatively small doses not exceeding 15 per cent of the skin erythema dose in 1 treatment period of six or seven days. The largest single group of patients were the 44 with Hodgkin's disease. Of this group, 30 showed improvement and all but 4 are alive. Fourteen have survived for more than six months and 2 for more than a year. The authors were impressed by the well marked and persistent tonic effect of the treatment and believe it should be employed routinely in Hodgkin's disease in conjunction with properly chosen doses of local irradiation for the bulky localized masses.

Certain difficulties in the use of the described method are discussed. In cases of leukaemia a tendency toward thrombocytopenia was sometimes noted. The development of leucopenia and anemia is common. Bulky lesions often do not regress satisfactorily. In the latter case, local irradiation in smaller doses than if used alone may be employed.

Certain modifications of the method for further investigation are proposed, such as more intensive treatment of a single portion of the body with shielding of the rest of the body, the use of small doses of general irradiation supplementary to local irradiation, and the use of unfiltered or lightly filtered irradiation for certain generalized cutaneous diseases.

Evaluation of the results obtained by this type of irradiation based entirely on statistics would raise the question as to whether similar or even better results might not be obtained by the usual local irradiation. As the method was new, the proper dosage had to be determined. The cases treated

were more advanced than the average case treated by localized irradiation. This report was made only a little more than two months after the last treatments. The authors believe that less attention should be paid to the figures and more to the impressions gained. They are of the opinion that while the method seems to be of little value in the treatment of the radioresistant tumors, it is an important addition to the treatment of radiosensitive tumors such as Hodgkin's disease, the leukaemias, lymphosarcoma, and multiple myelomata. The results in chronic lymphatic leukaemia and pseudoleukaemia seem superior to those obtained by local irradiation.

EARL E. BARTH, M.D.

### MISCELLANEOUS

Haas, M., and Lob, A. Short-Wave Diathermy and Its Use in Surgery (Die Kurzwellendiathermie und ihre Anwendung in der Chirurgie). *Deutsche Zeitschr. f. Chir.*, 1934, 243, 318.

Short-wave diathermy, in contrast to the long-wave diathermy used heretofore, is the therapeutic application of the electrical high-frequency alternating condenser field.

In long-wave diathermy (up to a wave length of 300 m) the alternating current is carried directly to the body by the aid of contact electrodes. To prevent burns and decrease the undesired resistance of the skin, the electrodes must be adjusted with as good contact as possible. In short-wave diathermy, on the other hand, a large air gap is necessary between both electrodes and the body surface. In long-wave diathermy the period of the alternating current is still so low that the capacity of the wave components as compared with the conduction current determined by Kirchhoff's law may be disregarded. In biological tissues this conduction current, after having overcome the relatively great resistance of the subcutaneous fatty tissues and produced maximal warmth in these tissues, follows the paths of least resistance, namely, the blood vessels. Because of the ramifications of the blood vessels, the deep tissues are reached only by a slight current and therefore are not warmed to any noteworthy degree.

On account of the considerably higher frequency and the consequently greater di-electrical conductivity in short-wave treatment, it is possible, by proper application of the electrodes, to apply most of the electrical energy to the deep tissues of the part treated without producing too much warmth of the superficial tissues. However, it must be mentioned that in the development of the current in the deeper structures the differences in diathermy or short-wave frequencies are not so great as has been claimed.

The authors are of the opinion that the first and only effect of treatment in the high-frequency electrical condenser field is the production of warmth in the tissues. Others claim that there is a specific electrical effect. While the authors do not

doubt Fraetold's experimentally demonstrated specific warmth effect produced by high frequency waves, they are of the opinion that the biological effects of the electrical condenser field which is described in the literature as specifically electrical should be designated as the specific effects of electrically produced warmth.

On the basis of theoretical considerations and experiments with models composed of layers of electrolytes it may be concluded with certainty that in a stratified medium a selective effect may be obtained in one layer with a certain di-electrical constant by means of a certain wave length, especially a maximal increase in the temperature in this layer. In body tissues only an approach to such an effect can be obtained because the body presents no stratified medium of similar electrolytes, but very dissimilar and inconstant relationships of size. Therefore the authors refuse to suggest a therapeutically favorable frequency for definite disease on the basis of the relation between conductivity di-electrical constants, and wave length or measurements of the conductivity of high-frequency current in individual biological objects.

The absolute values of di-electrical constants in human tissues are entirely unknown. Also unknown is the effect upon them of disease. Measuring disease is difficult. In addition to the factors of wave length and dose it is important to know the field strength. However measurement of this factor appears impossible. The authors attempted to determine the total field strength by repeated examinations of biological test objects with the aid of detailed physical methods. However they state that with regard to the field strength in the interior of the objects nothing can be said because, on account of the inconstancy of the di-electrical constants, it is subject to great variations. These difficulties may be partially surmounted if when the field-strength dosage is applied, the operator allows himself to be guided by the patient's subjective sensation of warmth. Following dosages not producing any appreciable or demonstrable warmth, no biological reaction can be demonstrated even by histological examination.

After these introductory remarks the authors discuss the indications for and the therapeutic results of short-wave diathermy especially in surgical diseases. In the literature there are numerous reports of favorable results from such treatment. Pyogenic diseases are described as especially suitable for short-wave treatment. It has been claimed even that surgical therapy is entirely super-

fuous in pyogenic infections, especially those of the skin. The authors state that their experience does not support this claim. The results of short-wave treatment by no means warrant disregard of the basic surgical principles for the treatment of pyogenic infections established by the school of von Bergmann, especially Lexer. Even today pyogenic infections which do not yield readily to rest and protective dressings must be opened as early as possible to establish drainage for removal of the bacteria and their toxins. As a rule short-wave treatment should not be employed until after such intervention. Only in mild cases and at the beginning of the illness may short-wave treatment be tried alone, and then all eyes under the observation and direction of a physician with surgical experience.

The authors review experiences in different types of diseases. Tendon-sheath phlegmons constitute a definite contra-indication to short-wave treatment. The authors strongly advise also against trying this treatment in acute suppurative osteomyelitis as valuable time is thereby lost for surgical therapy. In acute suppurative bursitis, short-wave treatment can be successful only after the bursa has been opened. Favorable results have been obtained in numerous cases of peritonitis. By prolonged treatment which in one case lasted ten hours, alleviation of the clinical symptoms as obtained, viz. drop in the fever, softening of the abdomen, improvement of the pulse and the passage of feces and flatus. In the treatment of joint tuberculosis no better results could be obtained. There was temporary diminution of the secretion from the fistula, but no healing of the bone lesions. In cases of joint injury short-wave diathermy finds numerous indications, but in these also it is to be considered only a supporting remedy. Its results in arthritic deformities are not uniform. Remarkably favorable results have been observed by the authors in cases of lumbago. The rapidity of the effect and the simplicity of the treatment recommend this form of therapy.

A side field for short-wave therapy is presented by postoperative treatment in cases of tendon sutures, tendon-sheath phlegmons, plastic operations, and adhesions after abdominal operations. With regard to the treatment of tumors, animal experiments with Ehrlich's mouse cancer showed that the treatment not only failed to destroy the neoplasms, but was generally followed by more rapid growth. It has failed also in cases of inoperable cancer of the breast in human subjects.

(Zürcher) MATTHIAS J. SEITZ, M.D.

## MISCELLANEOUS

### CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Learmonth, J R The Surgeon and Pain *Brit M J*, 1935, 1 47

From a clinical point of view pain may be classified as follows (1) pain due to a recognizable cause which cause can be dealt with, such, for example, as the pain resulting from the perforation of a peptic ulcer of the duodenum, (2) pain due to a recognizable cause which cause cannot be dealt with, such, for example, as the pain attendant upon inoperable malignant disease, and (3) pain of unknown cause, which can or cannot be abolished by surgical measures, such, for example, as the pain of trigeminal neuralgia on the one hand and the "painful face" that is not trigeminal neuralgia on the other. The author discusses the second and third types.

Before the performance of any operation undertaken primarily for the denervation of a painful part, it must first be proved that a frontal attack on the lesion is impossible. This decision may be necessary under any one of the following three sets of circumstances:

- 1 The site of the lesion and the site of the pain are the same. Under these circumstances the problem can be quickly solved by clinical examination alone or clinical and pathological examination.

- 2 The painful area is more extensive than the local lesion, as may be the case, for example, when carcinoma of the rectum invades the nerves of the sacral plexus. Under these circumstances care must be taken that the operation considered will not deal only with the visceral component of the pain.

- 3 The pain is a "referred" pain and the lesion is distant and possibly not even surgically accessible. In certain obscure cases of severe pain about the lower jaw, for example, the pain is a manifestation of cardiac disease and division of the posterior root of the fifth nerve for its alleviation would be disastrous.

When operations for the relief of pain are undertaken the following two different anatomical arrangements of pain fibers are encountered according to the somatic or visceral origin of the pain:

- 1 Somatic pain fibers from the periphery concentrated first in nerve trunks and, possibly after passing through a plexus, spreading out over posterior roots and becoming concentrated in the anterolateral tract. This tract is the most logical point of surgical attack as its proper division yields maximal analgesia with a minimal effect on other forms of neural conduction, either motor or sensory.

- 2 Visceral pain fibers concentrated in a strand or strands of one of the splanchnic nerves, spreading out again over the "roots" of the strand, and

possibly extending still further in the sympathetic paravertebral chains from whence they may enter the cord by way of many posterior roots and in the cord itself pass by one of at least two routes—the anterolateral tract and the ground bundles close to the gray matter. The most logical point of attack on visceral pain fibers is the particular splanchnic strand in which they are first concentrated.

Operations for the relief of somatic pain may be performed on the peripheral nerves, posterior roots, cranial nerves, and anterolateral tracts. Division of the anterolateral tract to abolish the pain of incurable disease was originally suggested by Spiller. The indications for this most valuable operation may be grouped as follows:

- 1 Pain due to the presence of an irremovable tumor which is pressing upon or infiltrating contiguous nerves. An example is the distressing pain of widespread malignant growths in the pelvis.

- 2 Pain due to pressure upon nerves by bony outgrowths—as in spondylitis, for example—and pain due to arthritis—of the hip for example.

- 3 Pain due to intractable neuritis, such as that of diabetes and that of neuritis of the cauda equina.

- 4 Pain in amputation stumps of the lower extremity.

The technical point of importance is the avoidance of injury to the crossed pyramidal tract, which is posterior to the proposed line of section. The division is usually made after removal of the spines and laminae of two vertebrae—as a rule, the third and fourth thoracic. In cases in which the pain is unilateral and is likely to remain unilateral a unilateral chordotomy suffices. Bilateral chordotomy is necessary when (1) the pain is bilateral and when, though unilateral at first, it is likely to become bilateral, as in malignant growths of the pelvis that involve first one and then the other lumbosacral plexus, and (2) the pain is in part visceral.

In occasional cases even bilateral chordotomy fails to relieve visceral pain. In this group are certain forms of tabetic gastric crises. The author calls attention also to cases on record in which the analgesia was not permanent. He states that failure of the operation to produce permanent analgesia may be due to insufficient depth of the cut into the cord or, possibly, to sensations of pain pressing into service for their transmission the posterior columns of the cord—an example of the well-known biological urge toward wholeness of the organism.

The pain of angina pectoris and the pain arising from disease of the pelvic viscera are two types of pain which illustrate the anatomical and physiological principles involved in surgical treatment for the relief of visceral pain. The greatest concentration of pain fibers from a viscus is to be found in the

sympathetic strands in the vicinity of the vascus. In the case of the heart these are in the cardiac plexus, but a direct attack on this plexus is obviously out of the question. After the first concentration, a spread over sympathetic roots occurs over a vertical extent. The upper boundary of the spread is the junction of the superior cardiac nerve with the superior cervical ganglion, and the lower boundary the ramus communicans of the fifth thoracic nerve. T extirpate all of the nerves in this spread is obviously undesirable. However if it is remembered that the highest available sympathetic connection to the spinal cord is by way of the ramus communicans of the first thoracic nerve, the vertical extent of attack can be greatly reduced.

It has been found possible to block afferent cardiac fibers outside the spinal canal by injecting alcohol 1 to and around the upper five thoracic ganglia of the sympathetic chain on the left side. This is not a serious procedure. Many good results have followed its use. It represents a compromise between the ideal procedure of attacking the most concentrated zone which is associated with high risk, and attacking over a wider front which is associated with a low risk. The first zone of concentration of sympathetic fibers from pelvic viscera which is conveniently open to surgical attack is the presacral nerve in front of the fifth lumbar vertebra. In this nerve pass afferent fibers connected with the bladder, the rectum, and some of the internal genital organs. As a rule resection of the presacral nerve can be done easily with minimal operative risk.

This operation has been performed with success in certain cases of intractable cystitis and in the palliative treatment of inoperable malignant disease of the bladder. It has been done also for the relief of intractable dysmenorrhea in which the pain is of colicky type. Cases of this condition must be very carefully selected.

In conclusion Lenneth says it is by no means certain that the beneficial effects of the operation are due directly to the division of pain fibers alone, although these are undoubtedly present in the nerve. Probably the division of vasoconstrictor fibers that traverse the nerve diminishes the intensity of symptoms due to inflammatory disease by improving the blood supply of the diseased part. In obstructive dysmenorrhea the efforts of the uterus to get rid of its contents may be assisted by reducing the tone of the cervix by dividing some of its extrinsic nerves.

MARCEL E. LEMMERT, M.D.

Kirsch, O. Investigation and Spasmophilia (Invasiveness and Spasmophilia). *Archiv f. klin. Med.* 934, 47, 836.

The author reports cases of ileo-iliac and ileocecal invagination in a seven-month-old infant with marked, though latest spasmophilia. This case supported the theory first advanced by Goldschmidt that spasmophilia is the cause of the marked contraction ring described by Nothnagel and Propper as the anatomical cause of invagination.

Kirsch also cites a number of observations recorded in the literature which tend to show that intestinal invagination has an evident relationship to tetany (frequent spastic obstipation, angulosis, narrowing of the pupils, delirium, opisthotonus, cramps, mechanical constrictures of the extremities, and spasms of the sigmoid flexure and anus). He calls attention to parallels between the two diseases. They occur in the same age period (the first year of life and the first half of the second year), twice as frequently in the male as in the female, and especially in robust and apparently well-nourished children. In both conditions there is a tendency toward grouping, that is, frequent occurrence on consecutive days, and the same seasonal curve which gradually rises to reach a peak in the spring, is low from August to the first half of November and then rises again until the end of the year. However in tetany the curve reaches its lowest point two months earlier in June and July. The course of this seasonal curve suggests that invagination is due to vitaminosis, especially as keratomalacia shows an exactly identical curve. This suggestion is supported by the greater frequency of the condition in males than in females, which is found in all types of avitaminosis; the greater frequency of the condition in more robust bodies which require larger supply of vitamins, and its frequency in infants, who require a large supply of vitamins for maximal growth. Also like other avitaminoses, both tetany and invagination become more frequent during the postwar period. The gastro-intestinal disturbances in the preliminary period of invagination and tetany coincide with the findings in other vitaminoses (beri beri, pellagra, and erythrodermia). The geographical distribution of invagination and tetany is also similar: both of these conditions being most common in England, America, and Denmark. In the Anglo-Saxon race, they may be related to congenital racial qualities (tall and slender statures) or to something with its dangers of vitaminosis, or to certain national food habits. The question as to whether invagination is to be included in the spasmophilic syndrome can be solved only by further chemical studies of the blood and galvanic irritability.

After Rayer pointed out the resemblance between tetany and beri beri, the author called attention to the resemblance between tetany and pellagra. As both of these conditions are produced by a lack of Vitamin B it seems reasonable to seek the cause of spasmophilia and perhaps also that of invagination in this group of conditions.

(Review) JOHN W. REEDMAN, M.D.

Freyman, M. E. Hemorrhage in Relation to Shock. *Ann. Surg.* 935, 444.

From experiments which he performed on cats and reports in detail the author draws the following conclusions:

1. Unanesthetized cats: the increase in the rate of the desaturated heart after hemorrhage is due to

the hypersecretion of epinephrin. No increase in the rate occurs when the adrenals are previously inactivated.

2 When saline solution is administered intravenously, the increase in the secretion of epinephrin resulting from hæmorrhage is inhibited only slightly and temporarily and the elevation of the blood pressure is only temporary.

3 When a 6 per cent solution of gum acacia in saline solution is injected intravenously, the increase in the secretion of epinephrin following hæmorrhage is inhibited to a greater degree and the elevation of the blood pressure may be sustained.

4 When the blood lost is re-injected, the increase in the secretion of epinephrin resulting from hæmorrhage is well inhibited and the elevation of the blood pressure is permanent.

5 If hæmorrhage initiates sympathetic hyperactivity of sufficient intensity, the resulting vasoconstriction leads to further diminution of the volume of circulating blood, probably through stagnation of the blood in the splanchnic area and the periphery. Such a process leads to shock. With restoration of the volume of circulating blood sufficient to inhibit the sympathetic stimulation, the vicious circle is broken and recovery results.

6 Adequate treatment of hæmorrhage requires early restoration of the volume of circulating blood to inhibit the sympathetic activity before a further loss of circulating blood occurs through stasis.

HERBERT F. THURSTON, M.D.

Babcock, W. W. Catgut Allergy. *Am J Surg*, 1935, 27, 67.

The author states that too little attention has been paid to the probability that many human beings are susceptible to catgut as allergic reactions to sheep serum have been demonstrated frequently. He believes that the allergic response may be due also to the presence of bacterial products or a specific toxin or both. In support of his theory he cites the frequency of the phenomenon in thyrotoxic patients and the improvement in wound healing that has occurred since the more extensive use of silk. He believes that many of the recurrences following the repair of herniæ may be attributed to weakening due to a catgut reaction with local necrosis about the suture.

With Pratt and Small, Babcock carried out a series of experiments on 120 individuals to determine the reaction of the skin to various suture material buried just beneath the surface. Chromic catgut produced a flare and wheal after twenty-four hours. When plain catgut was used, the same reaction was noted but was less marked. A reaction occurred in all of the patients tested, but varied in degree in different individuals. When rustless steel wire was used, very little reaction occurred even when the wire was buried under a cast for several weeks. The author states that fine rustless steel wire is stronger, smoother, and less irritating than any other suture with which he has had experience. He regards it of

most value for plastic operations for the closure of cleft palates, colostomies, and various types of fistulæ, but recommends it also for ligation in cases of infected wounds.

In summarizing, he says that chromic catgut may produce allergic reactions in the tissues which retard healing and may lead to wound disruption, and that No. 00 plain catgut may be extruded from the skin many weeks after its insertion. Silk is still the suture of choice for use in thyroidectomies, but annealed rustless steel wire is worthy of more extensive trial as a suture and as a ligature in septic wounds.

CORNELIUS J. KRAISSL, M.D.

Prussia, G. The Question of the Filterability of the Tuberculous Virus in Surgical Tuberculosis. (Sulla questione della filtrabilità del virus tubercolare nelle tubercolosi chirurgiche). *Ann Ital di chir*, 1934, 13, 1075.

Prussia states that it is still debatable whether the tubercle bacillus has an ultravirus, and that the interpretation of experimental lesions produced by cultures or tuberculous material is also very uncertain. In reporting experiments which he carried out to attempt to clarify some of the obscure problems in surgical tuberculosis, he describes in detail the methods he used in obtaining the tuberculous material, culturing it, filtering it, and injecting it into animals. In twelve instances the material used consisted of pus from cold abscesses, in two instances of exudate from a tuberculous empyema, in one instance, of exudate from orchitis and epididymitis, and in one instance, of the urine of a patient with renal tuberculosis. To control the specificity of the anatomicopathological lesions of the ultravirus, two guinea pigs were inoculated with a filtrate of diagnostic tuberculin. Therefore seventeen guinea pigs were injected with filtrate, seventeen with ultrafiltrate, and two with tuberculin. In each case serial transplants were made to a total number of seventy-six animals. Prussia concludes that the lesions found in the splenolymphatic system were caused, not by a virus, but by toxic elements in the filtrate and ultrafiltrate as he discovered similar lesions in the animals given injections of diagnostic tuberculin.

EUGENE T. LEDDY, M.D.

Jackson, H., Jr., and Parker, F., Jr. Agranulocytosis: Its Etiology and Treatment. *New England J Med*, 1935, 212, 137.

The authors discuss agranulocytosis on the basis of the literature and 103 cases which they have observed themselves. They state that the literature is at times confusing, opinions are divergent, and recorded data are not accurately tabulated. They conclude that while it is as yet impossible to state dogmatically whether agranulocytosis is to be regarded as a disease entity or a syndrome, the occurrence of such a disease entity appears probable. The etiology remains uncertain, but amidopyrine and related drugs seem to favor the development of the condition in certain cases.

The pathological changes in the bone marrow consist of arrest of maturation of the stem cell stage. Later in the course of the condition the previous existing stem cells are replaced to large extent by plasma cells and lymphocytes.

In the treatment, careful asepsis, adequate nursing, and intelligent general care of the patient are essential. At the present time the best method of stimulating recovery of the bone marrow is the intramuscular or intravenous injection of pent nucleotide.

In conclusion the authors state that until the nature, etiology and pathology of agranulocytosis are determined definitely by the diagnosis, treatment, and prognosis of the condition must remain subjective.

MARION E. LACHRETER, M.D.

Willis, R. A. The Structure of Teratomata. *J. Pathol. & Bacteriol.* 935, 40.

Teratomata have been attributed to internal twinning, the proliferation of dislocated or super-numerary blastomeres or other early embryonic cells or cell groups, the growth of fertilized polar bodies, the parthenogenetic or epigenetic proliferation of gonadal or extragonadal germ cells, and developmental errors affecting the primitive streak and early axial structures of the embryo. None of these theories is wholly satisfactory or has been definitely proved.

Willis reports a study in which fourteen teratomata were examined by the serial slab method and the distribution and relationship of the component tissues determined.

He states that in the identification of many of the tissues in these growths difficulties are encountered. An intimate knowledge of the histology of both adult and embryonic tissues is necessary. Immature glandular and neuro-epithelial tissues are readily confused with one another. Unless accompanied by hair follicles or cutaneous glands, stratified squamous epithelium cannot be identified as epidermal since squamous metaplasia frequently occurs in the glandular components of teratomata. Function in teratomatous tissues—secretion, hematopoiesis, movement, nervous activity—is of interest in connection with the problems of the prefunctional and functional differentiation of tissues.

Teratomata of the testis are almost always malignant. With rare exceptions the malignancy involves may or all of the component tissues, though perhaps in different degrees.

Most teratomata present no signs of somatic axis, segmentation, or delamination of germ layers. They possess no organs or true somatic regions. They exhibit an anomalous excess of certain components and an anomalous absence of others, abnormal mixtures and relationships of tissues, and the co-existence of tissues of widely different degrees of maturity. Because of these facts theories based on the idea that teratomata are homologous with fetus must be rejected. Therefore the twin inclusion and parthenogenetic hypotheses must be rejected.

Incomplete examination of a teratoma may give rise to the erroneous impression that it resembles fetus.

Tissue correlations probably similar to those obtaining in normal ontogeny are evident in teratomata. Various growing epithelia appear to induce specific changes in associated plastic mesenchyme. Certain glandular epithelia evoke the formation of smooth muscle, young central nervous tissue evokes chondrification, tooth development exhibits its characteristic and complex tissue correlations, respiratory mucosa induces the formation of cartilage, nervous tissue induces the formation of a meninges-like sheath or of meninges-like elements, epidermis induces the formation of dermis, and certain mucosal epithelia induce the formation of epitheloid tissue.

HENRY F. TUCKER, M.D.

## GENERAL BACTERIAL, PROTOZOAN AND PARASITIC INFECTIONS

Bickel, G. Colon Bacillus Septicæmia. A Study of Its Pathogenesis and Clinical Aspects (La colibacillose. Étude pathogénique et clinique). *Revue Méd. de la Suisse Rom.* 934, p. 37.

The important rôle of the colon bacillus in septicæmia diseases has been recognized only within the last dozen years, that is to say since the work of Hella-Mayer on the enterocolic syndrome. Today, the term colon bacillus is applied to acute and subacute septicæmias and groups of less well defined states indicating a generalized invasion of the organism by the colon bacillus. With elective localization in the urinary tract, the biliary tract or the nervous system.

The colon bacillus may change from one form to another. It is extremely resistant to heat, desiccation, light, and most antiseptics, and remains viable in water and soil for long periods. It grows well in all culture media and even in urine. It is little affected by changes in hydrogen ion concentration. Its metabolic products are de-amino acids, ammonia, indol, acetol, and phenol.

The virulence of the colon bacillus is normally low, but varies greatly. An increase in virulence may be due to its association with more virulent bacteria or decrease in the vitality of the tissues with which it is in contact. The toxins studied since 1933 by Gilbert show marked affinity for the nervous system and the gastro-intestinal tract. Vincent recently has isolated an exotoxin and an endotoxin, the former neurotoxic and the latter enterotoxic. The endotoxin causes symptoms of intestinal irritation and diarrhea. The exotoxin is found in young cultures, but the endotoxin occurs only in old cultures. These toxins are entirely independent of each other.

The physiological rôle of the colon bacillus has never been determined, but it appears that harmful effects are never produced by this bacterium in the absence of abnormal permeability of the intestine. The presence of colon bacilli in the blood and their elimination by the urinary or biliary tract are but transitory manifestations of changes in the intestine.

## MISCELLANEOUS

favoring the absorption of the bacilli and various toxic substances.

The colon bacillus is not the only agent of auto-infections of intestinal origin. In about 20 per cent of such infections the enterococcus and less frequently, Friedländer's bacillus, a streptococcus, a staphylococcus or a pneumococcus is the invading pathogen. Moreover the abnormal permeability of the intestine may be limited to toxins, the term bacillosis being inapplicable under such circumstances.

Acute enterocolitis due to the colon bacillus is common. It occurs most often in infants and frequently assumes an epidemic character. The infection may be localized in one part of the intestine. It is localized with special frequency in the region of the appendix. Whether or not the primary condition is appendicitis is problematical. However, the colon bacillus is found frequently in pyelophlebitis and abscesses following appendicitis and is the organism isolated from the blood most often in septicæmia following that condition. Localization may occur also in the biliary passages. Blood stream infections are usually due to stasis in the right half of the colon which, like an experimental ligature, allows the organisms to pass through the mucosa and increases the absorption of bacterial products.

The symptoms of colon bacillus septicæmia are extremely variable. A large number of forms of the condition have been distinguished on the basis of either the localization or the dominant symptoms. The author enumerates most of the ills that were formerly ascribed to auto-intoxication: indigestion, asthenia, psychic symptoms, headaches, dysmenorrhœa and other endocrine disturbances, vasomotor disturbances and slight fever—and classifies them into urinary, hepatic and nervous disturbances. Most definite appear to be the urinary disturbances in the form of bacilluria and pyuria. Intelligent treatment requires a preliminary study including most of the tests known to clinical pathology to which may be added a thorough study of the intestinal flora and its products.

The treatment is long and arduous. It should be directed first to the intestinal disturbance that is to say the stasis and should consist of the usual regimens recommended for spastic colitis.

ALBERT L. DICKSON, M.D.

Sauvage, L. A Contribution to the Study of Surgical Septicæmia of Exclusively Staphylococcal or Streptococcal Origin. Symptomatology (Contribution à l'étude des septicémies chirurgicales à staphylocoques et à streptocoques exclusivement Séméiologie). *Bull et mém Soc nat de chir*, 1934, 60: 1102.

The author defines septicæmias as general infections in which there is an intermittent or constant discharge of pathogenic bacteria into the blood stream with grave general symptoms due to the dissemination of the bacteria or their toxins in the viscera. He states that in the study of septicæmias

frequent cultural studies of the blood should be made at varying intervals in relation to the chills with the use of fairly large amounts of blood. However, he regards the clinical findings of more importance in the diagnosis than the laboratory findings, especially when the blood cultures are negative.

Both staphylococcal and streptococcal septicæmia may occur in a fulminating form or a prolonged form. Most common however, is the acute form developing in a few days or weeks which passes through the following three stages: an initial stage in which the infection is local, a second stage with the intermittent discharge of bacteria into the blood stream and a final stage of pollution of the blood stream by the bacteria. The stage of incubation is rarely recognized clinically. It ends, as a rule, with the first chill. Thereafter, the symptoms depend entirely on the manner in which the bacteria are disseminated in the blood.

In cases of streptococcal septicæmia two very unfavorable signs are a painless gross distention of the abdomen and the occurrence of organic changes with congestion at the bases of the lungs, anuria, extreme acceleration of the pulse rate, enlargement of the liver, and a subicteric tint of the skin. When either of these signs appears, death is to be expected in a few days. The favorable prognostic sign is cessation of the chills with gradual slowing down of the pulse rate.

A rather rare form of streptococcal septicæmia is observed in certain pyæmia and a chronic form with certain medical diseases. Of the three etiological factors—septic infection, infection at operation, and post-abortal infection—the last is the most dangerous.

The staphylococcal septicæmias are of two main types—the acute which resembles the streptococcal in its symptoms and the septicopyæmic type. The latter is characterized by metastatic abscesses, cutaneous eruptions, phlebitis, arthritis, and periods of remission which may be followed by acute recurrence. A third type—a prolonged form with multiple abscesses—may be distinguished. For the diagnosis of this type the same strain of staphylococcus must be found in all of the metastatic abscesses. This type is especially serious when the abscesses occur in the facio-buccal region.

WILLIAM C. BICK, M.D.

Kavanaugh, C. N. Tularæmia. A Consideration of 123 Cases, with Observations at Autopsy in One. *Arch Int Med*, 1935, 55: 61.

Of the 123 patients whose cases are reviewed, 60 were males and 54 were females. There were 5 deaths, a mortality of 4 per cent. The author reports the autopsy findings in 1 case. According to his classification, 108 of the cases were of the primary cutaneous type, 6 of the primary ophthalmic type and 9 of the cryptogenetic type. In 58 cases in which the incubation period was determined definitely, it averaged four and a half days.



Sixteen cases presented pulmonary involvement. The breast was involved in 2. Thrombi in the veins were found in 1 case. Pleurisy was a complication in 6 cases. Abdominal symptoms were prominent in 5 cases. Peritonitis was present in 1 case. Delirium was a prominent feature in 6 cases. Acute mania was a complication in 1 case. In 1 case of the primary ophthalmic type optic atrophy with loss of vision occurred in the affected eye. Purulent dacryocystitis occurred in 1 case. Decided splenomegaly with perisplenitis was present in 3 cases. Osteomyelitis was found in 1 case. In 4 cases the only external evidence of the disease was cervical adenitis. Subcutaneous nodules were present in 28 cases, and a cutaneous eruption occurred in 3 cases (8.7 per cent).

The author gives brief review of the literature and discusses important facts pertaining to the history, epidemiology, pathology, diagnosis, and treatment of the condition.

WALTER H. N. DICK, M.D.

Spoerri, R. Investigations on the Action of Anaerobic and Aerobic Bacteria on the Surviving Small Intestine of the Rabbit (*Ueber das Verhalten der Wirkung anaerober und aerober Bakterien auf den verlebenden Kaninchen Dünndarm*). 934. Zurich, Dissertation.

The difference in mode of life of aerobic and anaerobic bacilli raises the question whether as a consequence, different substances, varying from one another in their action, may not be produced in the nutrient in the medium. The questions which Spoerri attempted to answer in the investigations on which this dissertation is based are the following:

1. Do the products of metabolism contained in different bacterial cultures exert any action on the smooth musculature of the small intestine of the rabbit which differs from the action of sterile bouillon?
2. Do these actions of decomposition products differ only for the two large groups, or can differences in activity be demonstrated even for the different kinds of bacteria?
3. Are the possible differences only quantitative or qualitative?
4. Is the result affected by the age of the culture?
5. Does the composition of the nutrient medium exert an influence?
6. Is the action of the metabolic end products formed in the medium exerted on the muscle cells directly or by way of the sympathetic nervous system?

In his studies the author was of course unable to investigate the influence of definite chemical compounds. In such investigations it is necessary to recognize the fact that we are always dealing with a mixture of substances. We therefore obtain only a summation effect, and if the antagonists maintain a balance, this may be null in spite of the presence of active substances. However, there is also the

possibility that one product may be much stronger in its physiological action than all of the others.

The apparatus used by Spoerri was a modification of the apparatus of Guggenbuehm and Loefler. The investigations were carried out on the surviving small intestine of the rabbit. Oxygen was introduced into one end through a capillary tube and the other end fastened by a fine thread to the arm of a recording apparatus. The preparation to be tested was brought into contact with the intestine mixed with Ringer's solution. In the investigations on the influence of age, meat extract prepared by one and the same method was used in the preparation of all of the bouillons in order to avoid difference in the material of origin. The inoculation of this fluid with fresh 18 hr-bouillon cultures of the same strain of bacteria was done for one series at the same time and the culture obtained after incubation for one, three, six, ten, and twenty days were used for the experiments. For every series of experiments a certain quantity of the same bouillon was removed on each of the days mentioned and kept under the same conditions for use as a control. For the preparation of macerates and filtrates, Spoerri employed 2 liter retorts with large quantities of culture which had been inoculated with the same strains. The incubation period varied up to ten days. In the preparation of the filtrate the culture was centrifuged, rendered free of bacteria by means of a Seltz filter and then used immediately. The centrifugate was washed three or four times with physiological salt solution until the yellow tint of the centrifuge fluid had disappeared. It was then mixed with from 10 to 100 cc of sterile water and filtered three or four times. The precipitate from 4 liters was diluted to 100 cc with physiological salt solution and this fluid brought into contact with the intestine in Ringer's solution in amounts of from 1 to 10 cc.

The effect of these different preparations on the activity of the intestine as studied in regard to the amplitude of contraction, tone, and frequency. After testing the movements of the intestine in Ringer's solution alone and following the addition of acetylcholine, pilocarpine, and atropine as well as after exclusion of the parasympathetic, Spoerri tested the influence on the intestine of sterile bouillon in the form of cysteine-peptone bouillon and cysteine-glucose bouillon.

The results of the experiments with the different kinds of bouillon were in general identical. When all three kinds of bouillon were used, as failed decrease in contraction amplitude and tone was followed by recovery in which the contraction amplitude went above normal and the tone reached normal. In general, the frequency remained unchanged.

Comparative experiments showed that these typical reactions were due to active substances already present in the meat extract and not to the added cysteine, peptone, or glucose. The bouillon effect underlying the action of the further addition

of adrenalin, pilocarpin, and acetylcholin. It is assumed that the action of these drugs is exerted on the muscle cells not directly, but by way of the nervous elements. However inoculation of the described nutrient media with a culture of the para-anthrax bacillus showed great differences between the nutrient media and the cystein peptone bouillon culture. The addition of the drugs named could no longer suppress the effects of the cystein peptone products. The cystein peptone cultures contained at first paralyzing substances. Twenty day cultures contained tonic substances. A one day culture was without definite effect. After the first week, the cystein glucose bouillon culture exhibited an action increasing the contraction amplitude and after the ninth day an action increasing also the tonus. The peptone bouillon culture showed a slightly tonic action. Therefore a paralyzing action is present only in the case of cystein bouillon cultures and a tonic action in the case of old cystein peptone bouillon cultures and young peptone bouillon cultures. Comparative tests with acetylcholin, pilocarpin and adrenalin showed that the less toxic substances which were present in a para anthrax culture exerted their influence on the nervous system, whereas the mechanism of action of the substances with a strongly paralyzing effect was not explainable (it was impossible to determine whether the action was direct or indirect). The active substances passed over into the filtrate but were not demonstrated in the filtrate.

The author is inclined to ascribe the paralyzing action of his cultures to various decomposition products produced by the para anthrax bacillus but not to the specific para anthrax toxin.

Investigations carried out with the Novy bacillus of malignant edema yielded results that were essentially the same as those obtained with the para anthrax bacillus. The active products could be obtained from the cystein peptone bouillon culture. The filtrated bacteria had no action. The filtrate had the same action as the whole culture.

In investigations with the anthrax bacillus (bacillus chauvoei) a cystein peptone bouillon culture used at the highest point of toxicity produced as did also filtrates of this culture a tetanic effect. The production of this effect continued until the tenth day of the culture. The culture then rapidly became ineffective. The influence was exerted by way of the nervous elements.

When tetanus cultures were used the intensive action of the cystein peptone bouillon culture (paralysis) was present only during the first few days and then vanished, a fact proving that the cause of the paralysis was not the true toxin since the latter did not reach its greatest activity until after ten days at a time when the peptone cultures were almost inactive.

Spoerni discusses the action of methylamin, indol, and diamine.

The investigation of aerobic bacteria by the same method yielded the following results.

The one day old and three day old cystein peptone bouillon cultures and the one day old cystein glucose bouillon culture (parasitophus Gertner) produced paralysis. In the case of the first the reaction occurred on the addition of as little as 0.5 c cm. and in the case of the last on the addition of 5 c cm. It is therefore apparent that in these experiments also the degree of the paralyzing action paralleled the peptone content of the bouillon and was not dependent on the quantity of toxin.

Investigations with fowl cholera showed results that differed only slightly from those obtained with sterile bouillon. On the ninth day, the cystein peptone bouillon culture in an amount as small as 2 c cm. was capable of causing a marked paralysis of the intestine. Up to that time a stimulation was manifested. In these experiments also the dependence of the amount of toxic substances upon the peptone content was apparent.

The findings may be thus summarized. When sterile bouillon was used the course of the curves was always the same whether the bouillon contained cystein plus peptone or glucose or only peptone. In the end effect there was a very slight increase in the contraction level whereas tonus and frequency remained at their initial levels. This effect was brought about through substances contained in the unmodified meat extract. The age of the bouillon was without special influence on the result. As the bouillon effect was always eclipsed by the effect of the added drug, an injury to the muscle cells could be ruled out with certainty. When grown cultures were added this picture changed completely. Under these circumstances an important part was played not only by the age of the cultures but also by the special additions to the bouillon. Moreover there appeared certain differences in mode of action from bacterium to bacterium in respect to the direction and the degree of the change, but especially in respect to the minimal dose by which the typical reactions were elicited. One clear fact demonstrated was that with all bacterial additions the cystein peptone cultures showed the most intense action, in comparison for example, with the cystein glucose culture. In the case of the cystein peptone culture the most intensive action consisted chiefly of a general paralysis which appeared either on the first day (Novy tetanus, and Gertner bacilli) and disappeared soon (sixth day), or appeared only with older cultures (sixth to ninth day) (para anthrax, fowl cholera bacilli). An exception was found only in the case of the anthrax bacillus, by which the amplitude and frequency of the contractions were diminished and the tonus was increased (tetanus), a picture which was produced only by twenty day-old para anthrax cultures. On the addition of small quantities of culture there were bivalent actions, an increase of the contraction amplitude, sometimes also an increase of tonus (fowl cholera Gertner, and Novy bacilli) either with old cultures (twentieth day in the case of the para anthrax bacillus and the anthrax

bacillus, fifteenth day in the case of tetanus bacillus, and sixth day in the case of the Gaertner bacillus) or very young cultures (low cholera bacilli p 1 the third day)

A difference between the action of anaerobic and aerobic bacilli as regards the production of minimal active doses was not apparent. The cystine-glucose culture, which contained only one-tenth as much peptone as the cystine-peptone culture, produced chiefly an increase although it furnished excellent conditions for growth of the bacilli. However there was lack of the peptone necessary for the elaboration of toxic substances. The author is inclined to ascribe the action of his cultures entirely to the production of lower decomposition products of protein. He calls attention to the opposite behavior of the early formation of toxic substances in the culture in contrast to the slow formation of the specific toxins. He states that for the elaboration of the active toxins in the cultures oxygen is not necessary. It determines only whether the means is given to living creature to break down protein bodies in this or in that way. The ways are numerous (decarboxylation, splitting off of amino-acids with simultaneous reduction red oxon and deamination, hydrolytic deamination, alcoholic fermentation). Of the products arising therefrom, which are numerous and varied, the amines, methylamine, dimethylamine, trimethylamine, and diethylamine, are of the greatest physiological importance next to histamine. The pharmacological action of the primary secondary and tertiary amines consists mainly of a central action, narcoosis and paralysis. The higher amines possess sympathomimetic action similar to that of adrenalin. In general it may be said of the action of products of protein decomposition that excitation appears after small doses and paralysis after large doses (Weichardt). The balance of the actions was shown also in Spoerni's investigations. Excitation was manifested on the addition of culture with slight activity (fresh and very old cultures) and paralysis on the addition of culture with marked activity.

From the investigations with filtrate and inoculate it appears that the active substances are not present in the bodies of the bacteria but are to be found in the filtrate. The stimulating effect is produced, not by direct action on the muscle cells, but by an indirect action on these cells produced through the nervous elements. Whether the paralyzing action of the larger doses likewise depends upon nervous action has not been determined, but the possibility of injury to the muscle cells must be considered.

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#### DUCTLESS GLANDS

Ross, C. Experimental Studies on Surgery of the Parathyroids (*Ricerche sperimentali sulla chirurgia delle paratiroidi*) *Arch Ital di chir* 934, 35, 5

Mandell was the first to remove an adenoma of the parathyroids in case of Recklinghausen's disease

with brilliant results. It concluded that hypertrophy of the parathyroids is the cause of Recklinghausen's disease, that the parathyroids are the chief regulators of the distribution of calcium and possibly also of phosphorus, and that hyperfunction of these glands causes decalcification of the bones with an increase in the calcium in the blood and increased elimination of calcium in the urine. This theory led to the performance of parathyroidectomy in numerous diseases in which there is metastatic calcification or increased density of the connective tissues, presumably to hyperfunction of the parathyroids. Among these are rheumatic spondylitis, chronic ankylosing rheumatism, scleroderma, keloid, metastatic calcification of the kidneys, and contraction of the palmar ponceuritis.

While the results have been good in some of these other conditions, they have not been comparable to the results in Recklinghausen's disease. Moreover facts seemingly contradictory to Mandell's theory have been recognized. There are cases of Recklinghausen's disease without hypertrophy of the parathyroids and cases of hypertrophy of the parathyroids without bone lesions or hypercalcemia. It has been found also that results similar to those of parathyroidectomy can be obtained by simple exploratory operation on the neck. (About removal of the parathyroids and even without ligation of the superior thyroid artery to cut off their blood supply as recommended by Leriche.

In an effort to explain these facts and study the function of the parathyroids the author performed a series of numerous experiments on rabbits and dogs. In some of them he bled and ligated the thyroid and parathyroids without removing them and without injuring the vessels and nerves, and in others he crushed or sectioned the nerves supplying the parathyroids. He found that simple operative trauma and resection of the vagosympathetic trunk in the neck did not cause any changes in the structure or function of the parathyroids, but that peripheral sympathectomy of the superior thyroid artery or removal of the superior cervical ganglion was followed by temporary decrease in the calcium content of the blood due probably to decrease of parathyroid function.

ANNEX GOM MONSIEUR, M D

#### EXPERIMENTAL SURGERY

Detorilli, M. Experimental Studies on the Use of Thymic Extracts for Hemostasis (*Ricerche sperimentali sull'uso di estratti di timo scopo emostatico*) *Arch Ital di chir* 934, 3, 969

Detorilli first reviews the problem of hemostasis particularly in operations on the liver. He states that, notwithstanding the fact that much work has been done on the subject, there is little agreement with regard to the hemostatic agent of choice or the applicability of given method under other laboratory conditions. Among the most promising methods of inducing hemostasis are those in which tissue or tissue extracts are applied to the



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### Head

- Fracture of the dorsum sellae, report of case M L ALLEN *Radiology* 935, 24
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- The occurrence of frank hemangiomas T B HORTON and H A WYNN MITCHELL *Ann Surg* 35, 76
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## Conditions of the Bones, Joints, Muscles, Tendons, Etc

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- Agranulocytic angina, two cases J H FISHER. *Lancet* 1934, 227 1217
- Agranulocytic angina treated with pentnucleotide E J SMITH *Lancet* 1934, 227 1219
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- Pilonidal cysts L K FERGUSON. *Ann. Surg*, 1935 101 469
- Traumatic epithelial cysts L R. TAUSSIG and H. V ALLINGTON *California & West Med*, 1935 42 11
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Biological problems in chemotherapy W. YONKE and F. MURPHY LANCET, 935, 883, 9

Experiments with vaccine treatment for surgical diseases I. PHILIPPOVICH Zentralbl f Chir, 934, p. 87

The biological aspect of surgery R. KILPAT Med Welt, 934, p. 27

The determination of the resistance of the body to surgery F. SCHUTTER WÄRDEN Arch f klin Chir, 934, 79, 65

Surgical shock A. CLARK Glasgow M J, 935, 3

### General Bacterial, Protozoan, and Parasitic Infections

Surgical septicemia G. MÉRIVET Bull et mémo Soc. nat de chir, 934, 60, 333

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The recent use of streptococcal infection H. L. WALLACE and A. B. SMITH LANCET, 934, 97, 39

Therapeutic use of concentrated antistreptococcus serum of the New York Stat. Department of Health in cryptogenic streptococcosis and osteomyelitis of children A. B. SHERMAN, M. J. SEYMOUR and W. J. MACNEAL Arch Surg, 934, 90, 669

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### Ductless Glands

Studies in the embryology and histology of the ductless glands G. A. HYATT Med Rec New York, 935, 14, 65

Acromegaly and splanchnomegaly F. ROBERTS LANCET, 935, 38, 25

Adenoma of the pituitary gland, with special reference to the pituitary basophiles of Cushing W. SUTCLIFF Brit J Surg, 935, 330

Neoplastic adenoma (pituitary basophiles) report of one, with clinical improvement of systemic manifestations after irradiation of the pituitary M. G. WOOD, J. R. MOORE, and B. R. YOUNG Radiology, 935, 24, 53

Investigations on the relation between the sympathetic nervous system, the blood calcium and the parathyroids M. TARANTZIS Arch ital di chir, 934, 38, 159

A case of infantile tetany of the extremities and pyrexia treated successfully by cervical sympathectomy; parathyroid resection A. JURA and M. MAYER Bull et mémo Soc. nat de chir, 934, 60, 335

Experimental studies on surgery of the parathyroids C. ROSS Arch ital di chir, 934, 38, 57 [479]

### Surgical Pathology and Diagnosis

A standardized technique for the blood sedimentation test M. M. WRIGHT and J. W. LAMARCA Am J M Sc, 935, 89, 69

### Experimental Surgery

Experimental studies on the use of tissue extracts for hemostasis M. DARRILL Ann ital di chir, 934, 3, 669 [479]

The effect of suprarenal denervation and splanchnic section on the sugar tolerance of dogs O. DE TARKS and F. P. COTTELL Arch Surg, 935, 90, 1

JUNE, 1935

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## CONTENTS

I	Index of Abstracts of Current Literature	III-VI
II	Authors of Articles Abstracted	VIII
III	Abstracts of Current Literature	505-573
IV.	Bibliography of Current Literature	574-598
V	Index to Volume 60	I-XXVI

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# CONTENTS — JUNE, 1935

## ABSTRACTS OF CURRENT LITERATURE

### SURGERY OF THE HEAD AND NECK

#### Head

- THEODORESCO, D., and HOFER, O. Cancers of the Cheek 505

#### Eye

- RAMSAY, A. M. Clinical Science and Ophthalmology 503  
O'BRIEN, C. S., and LEINFELDER, P. J. Unilateral Exophthalmos 506  
CHANG, L. W. Dislocation of the Lens 507  
PI, H. T. Subcapsular Cataract in Osteomalacia. 507  
PI, H. T. Cataract Among the Chinese 507  
DUNNINGTON, J. H., and MACNIE, J. P. Detachment of the Retina. Operative Results in 150 Cases 507

#### Ear

- HOWARD, R. C. The Window Operation for Hæmatoma Auris and Perichondritis with Effusion 508  
FINE, A. Oculomotor Nerve Spasm in Gradenigo's Syndrome 508  
KEEN, J. A. Clinical Observations on Chronic Deafness in Children 508

#### Nose and Sinuses

- TILLEY, H. Chronic Pyogenic Inflammation of the Antrum and Other Accessory Sinuses 509

#### Mouth

- VEAU, V. The Skeleton of Harelip 509

#### Pharynx

- MARTIN, H. E. The Fractional or Divided Dose Method of External Irradiation in the Treatment of Cancer of the Pharynx, Tonsil, Larynx, and Paranasal Sinuses 564

#### Neck

- KECKSÉK, Z. Advantages of High Tracheotomy 509  
CANELO, C. K., and LISSER, H. Two Cases of Childhood Myxœdema Reported for the Purpose of Emphasizing the Importance of Bone Age Studies 510  
KALLEN, L. A. Vicarious Vocal Mechanisms The Anatomy, Physiology, and Development of Speech in Laryngectomized Persons 510  
TUCKER, G. Cancer of the Larynx. Observations in 200 Consecutive Cases 511  
TABANELLI, M. Investigations on the Relation Between the Sympathetic Nervous System, the Blood Calcium, and the Parathyroids 572

### SURGERY OF THE NERVOUS SYSTEM

#### Brain and Its Coverings, Cranial Nerves

- CAIRNS, H., and DONALD, C. The Diagnosis and Treatment of Abscess of the Brain 512  
SCHJØTT, A. Suprasellar Craniopharyngioma 512  
PFAHLER, G. E., and SPACKMAN, E. W. Further Observations on the Roentgen Treatment of Pituitary Tumors 512  
FRAZIER, C. H. The Surgical Management of Chronic Subdural Hæmatoma 513  
DOLGOPOL, V. B., and NEUSTÄEDTER, M. Meningo-Encephalitis Caused by Cysticercus Cellulosa 514

#### Spinal Cord and Its Coverings

- BELLUCCI, B. Roentgenological Visualization of the Ependymal Canal in a Case of Hydromyelia 515  
FLETCHER, C. M., WOLTMAN, H. W., and ADSON, A. W. Sacrococcygeal Chordomata. A Clinical and Pathological Study 515

#### Peripheral Nerves

- SARKOSTE. Isolated Tumors of the Peripheral Nerves 516  
GRENEY, H., DUCROQUET, R., ISAAC GEORGES, P., and MACÉ, M. Neurofibromatosis with Cutaneous and Bony Changes 516

#### Sympathetic Nerves

- CAPORALE, L. The Dynamic Hydronephroses and Sympathectomy of the Ureter 545  
TABANELLI, M. Investigations on the Relation Between the Sympathetic Nervous System, the Blood Calcium, and the Parathyroids 572

### SURGERY OF THE THORAX

#### Chest Wall and Breast

- LEPPER, E. H., and BAKER, A. H. Diffuse Intraduct Carcinoma of the Breast 517  
LEVIN, I. The Relative Value of Surgery, Radium, and Roentgen Therapy in Carcinoma of the Breast 517  
HUTCHISON, R. G. Interstitial Radium Treatment of Carcinoma of the Breast 517

#### Trachea, Lungs, and Pleura

- OVERHOLT, R. H., and PILCHER, L. S., 2ND. Changes in Venous Pressure After Thoracoplasty, Its Significance in Relation to the Extent of Rib Removal 518  
FRIED, B. M. Bronchiogenic Cancer Combined with Tuberculosis of the Lungs 518



- JONES, E. P., and BEARLY, W. C. Primary Pulmonary Sarcoma 519
- Heart and Pericardium
- BERNARDI, E. The Experimental Pathological Anatomy of Pericarditis 520
- SCHUMER, W. Heart Disease Complicating Pregnancy 522
- FITZGERALD, J. F. The Management of Pregnant Women with Heart Disease 522
- Esophagus and Mediastinum
- FRANKLIN, O. Swallowed Foreign Bodies 520
- AUSTON, A. Cricotriangular Stenosis of the Esophagus, Indications for and Late Results of Its Treatment 5
- JACK, J. A Case of Primary Tuberculosis of the Esophagus 521
- Miscellaneous
- DUNNELL, S. R. T. Diaphragmatic Hernia 5
- FORRY, F. Congenital Hernia Through the Right Dome of the Diaphragm 52
- TETTERDALE, P. E. Diaphragmatic Hernia at the Esophageal Hiatus, the Short Esophagus, and Thoracic Stomach 5
- ROBERTS, L. G., and EVINSON, J. B. The Incidence of Hiatal Hernia in Pregnant Women and Its Significance 52
- ANDERSON, R. DEW. Report of the Chest Tumor Registry 523
- SURGERY OF THE ABDOMEN**
- Gastro-Intestinal Tract
- VONHAGEN, E. Complications of Foreign Bodies in the Stomach 524
- WILKINSON, G. Collective Inquiry by the Fellows of the Association of Surgeons into Gastrojejunal Ulceration 524
- GRILL, A. A Contribution to the Clinical and Roentgenological Study of Postoperative Peptic Ulcer 525
- EMERY, F. S. J., and MONROE, R. T. Peptic Ulcer: Nature and Treatment Based on Study of 415 Cases 525
- OUTLINE, W. H. The Place of Surgery in the Treatment of Peptic Ulcer 526
- VERHOEF, C. RICHARD, E. and HENRIK, J. Contusions and Ruptures of the Small Intestine in Closed Injuries of the Abdomen 527
- ENYHART, E. Intestinal Intussusception (Cecal Tumors) 527
- WOLTER, J. A. Jejunostomy with Jejunal Alimenta- tion 528
- GARRETT, W. B. and LLOYD-DIXON, O. V. Colo- stomy 529
- STONE, C. S. J. Acute Appendicitis in Children 529
- DUNN, E. M. and ZOLLINGER, R. Acute Tuberculous Appendicitis 530
- LARRY, F. H. and CATTELL, R. B. Two-Stage Abdominoperineal Resection of the Rectum and Rectosigmoid for Carcinoma 530
- RAVENH, F. W. Graded Perineo-Abdominal Resec- tion of the Rectum and Rectosigmoid 53
- Liver, Gall Bladder, Pancreas, and Spleen
- DYER, L. A Contribution to the Treatment of Cirrhosis of the Liver by the Talon Operation 53
- DANIEL, M. Rupture of the Normal Spleen Without Known Cause: Spontaneous Rupture? 532
- Miscellaneous
- SMITH, J. Painful Abdominal Conditions in Child- hood 533
- REYNOLDS, A. The Anatomical Changes in the Liver in Various Syndromes of the Right Side of the Abdomen 533
- SCHULTZ, E. An Unusual Form of Retroperitoneal Hernia—Hernia Mesenterico-Pancreatica Dextra, Brotsche 534
- CAMPBELL, Y. Cryptogenic Peritonitis Caused by Pneumococci and Related Bacteria 534
- GYNECOLOGY**
- Uterus
- MONROE, T. N. Studies on the Movements of the Uterus. II. The Action of Extract of the Corpus Luteum on the Uterus of the Unanesthetized Rabbit. III. The Action of Gonadotropic Ex- tracts on the Movements of the Uterus of the Unanesthetized Rabbit 537
- DYER, M. E., ANAST, F. L., ROBERTS, G., KRAMER, M. S. and LEASLEY, R. R. A New Active Prin- ciple in Ergot and Its Effects on Uterine Motility 537
- CHAMBERS, H. The Histological Classification of Cancer of the Uterine Cervix and the Relation Between the Growth Structure and the Results of Radical Treatment 537
- Adnexal and Perimetria Conditions
- NICKOLSON, G. W. Studies on Tumor Formation. XV. A Feline Ovarian Teratoma 538
- External Genitalia
- KIRWAN, T. J. and LOVELL, O. B. Radical Relief of Vesicovaginal Fistula: Report of an Unusual Case of Eversion of the Bladder Through the Fistulous Opening, and Review of Sixty Cases Seen at New York Hospital During the Past Twenty Years 538
- Miscellaneous
- SAMUELS, E. Investigations on Changes in the Men- strual Cycle and the Puerperal State 539
- CARSON, D. J. Menstruation and Menstrual Dis- orders 539
- MOORE, C. R. Hormones in Relation to Reproduc- tion 539
- WARR, N. J. and DUFFY, E. A. The Prolonged Ad- ministration of Testes and Thelids to Male and Female Rats and Its Bearing on Reproduction 539
- TRAUBA RAO, O. Malignant Melanotic Tumors of the Female Genitalia 54

## OBSTETRICS

## Pregnancy and Its Complications

- RIGLER, L. G., and ENEBOE, J. B. The Incidence of Hiatus Hernia in Pregnant Women and Its Significance 523
- TATA, G. The Influence of the Hormones of Pregnancy on the Growth of Bacteria 541
- LLUSTIA, J. B. Studies on Ammonia in Eclampsia 541
- PECKHAM, C. H. An Analysis of 127 Cases of Eclampsia Treated by the Modified Stroganoff Method 541
- SCHUMAN, W. Heart Disease Complicating Pregnancy 542
- FITZGERALD, J. E. The Management of Pregnant Women with Heart Disease 542
- MAHON, R. The Obstetrical Prognosis of Large Uterine Fibromata 542
- PILLONI, S. A Case of Abortion Due to Psychic Trauma 543

## Labor and Its Complications

- HAYES, W. I. Cesarean Section A Review of 486 Consecutive Operations at the Women's Hospital, Melbourne 543

## Puerperium and Its Complications

- SASSO, E. Investigations on Choline in the Menstrual Cycle and the Puerperal State 538

## GENITO-URINARY SURGERY

## Adrenal, Kidney, and Ureter

- KIMBROUGH, J. C. The Surgical Treatment of Hydro-nephrosis 545
- CAPORALE, L. The Dynamic Hydronephroses and Sympathectomy of the Ureter 545
- GIBSON, T. E. Nephrectomy Versus Autonephrectomy in Renal Tuberculosis 545

## Bladder, Urethra, and Penis

- MUNRO, D., and HAHN, J. Tidal Drainage of the Urinary Bladder A Preliminary Report of This Method of Treatment As Applied to "Cord Bladders," with a Description of the Apparatus 546
- PFÄHLER, G. E., and VASTINE, J. H. Roentgen Diagnosis and Treatment of Tumors of the Bladder 546
- HINSELMANN, H. What Does Leucoplakia of the Penis Teach Us? 546
- LERICHE, R., and LUCINESCO, E. Heterotopic Osteogenesis Obtained with the Aid of Grafts of Bladder Mucosa in the Muscles or Grafts of Aponeurosis in the Bladder 567

## Genital Organs

- ACHENBACH, S. The Treatment of Varicocele 547
- CECIL, A. B. The Extrusion Operation for Tuberculosis of the Epididymis 547

## Miscellaneous

- HANSEN, J. Experience and End Results in Injuries of the Urinary Passages 547

- HOWARD, M. E., and STRAUSS, M. J. Lymphogranuloma Inguinale A Report of Sixteen Cases In and Around New Haven 548

## SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

- Conditions of the Bones, Joints, Muscles, Tendons, Etc. 541
- PI, H. T. Subcapsular Cataract in Osteomalacia 507
- MAXWELL, J. P. Further Studies in Adult Rickets (Osteomalacia) and Fetal Rickets 549
- VASTINE, J. H., and BACON, E. P. Osteitis Tuberculosa Multiplex Cystica, with a Report of Two Cases 549
- VAN DER LINDEN, P. Perarticular Injections of Novocain in the Management of Sprains and Traumatic Arthritis 550
- PAULLAN, D. Research on the Myopathies 550
- CHAUMET, G. Painful Conditions of the Brachio-scapular Region and Their Treatment with Physical Agents 550
- ŠEJHAR, J. The Tennis Arm, Its Cause and Treatment 551
- KADRŇKA, S., and MACH, R. Hydromata of the Epicondylar and Bicipital Bursae Containing Rice Bodies A Contribution to the Clinical and Roentgen Study of Chronic Bursitis 551
- FÉVRE, M. The Pathogenesis of Painful Pronation in Young Children, Catching of the Bicipital Tuberosity on the Posterior Crest of the Sub-sigmoid Cavity of the Ulna 552
- AIMES, A., and PARES, L. Condensation of the Semi-lunar 552
- JANSEN, M. Notes on Scoliosis and Round Shoulders, Their Cause and Their Treatment 552
- LINDE, F. Can the Old View of the Constantly Accidental Origin of Rupture of the Interarticular Ligaments of the Knee Be Saved? 553
- Surgery of the Bones, Joints, Muscles, Tendons, Etc. 553
- SCHWARTZ, A. Results of Tendon Suture in the Hand 553
- SAUNDERS, J. T. The Etiology and Treatment of Clawfoot Report of the Results in 102 Feet Treated by Anterior Tarsal Resection 554
- Fractures and Dislocations 546
- MENEGAUX, G., and ODIETTE, D. The Influence of Certain Metals on the Fixation of the Mineral Components in Cultures of Osteoblasts 554
- HOUANG, K. The Role of the Nutrient Arteries of the Long Bones in the Formation of Callus and the Calcification of the Medullary Cavity 555
- SEVER, J. W. Non Union in Fracture of the Shaft of the Humerus 555
- ROGERS, W. A. The Treatment of Fractures of Vertebral Bodies Uncomplicated by Lesions of the Cord 555
- CONTIADES, X. J., and POLITIS, A. M. The Surgical Treatment of Recent Depressed Fractures of the Tibial Articular Surface 556
- MASMONTEIL, F. The Treatment of the Malunion of the Ankle 557

## SURGERY OF BLOOD AND LYMPH SYSTEMS

## Blood Vessels

- BART, L. and RICHOUT, H. A Critical Study of Arteriography 553
- LEVET, J. The Dangers of Arteriography 554
- WINKFIELD, P. The Blood Changes in Clinical Thrombophlebitis and Their Diagnostic Importance 558
- DAVIES, G. F. S. Pulmonary Embolism 56
- RUTHERFORD, W. The Cause of Death in Fat Embolism 57

## Blood Transfusion

- KOMODA, A. S. The Hemostatic Properties of the Mice-Blood Mince "Sangre" An Experimental Study 559
- BURMAN, A. The Problem of Blood Transfusion 560

## SURGICAL TECHNIQUE

## Operative Surgery and Technique; Postoperative Treatment

- HYMAN, H. T. and TUCHOFF, A. S. W. Therapeutics of the Intravenous Drop: Further Observations 560
- WARTON, H. J. Massive Intravenous Injections: An Experimental Study 560
- DAVIES, G. F. S. Pulmonary Embolism 56

## Antiseptic Surgery; Treatment of Wounds and Infections

- FISKE, W. B. The Roentgen Treatment of Carcinomas 56

## Anesthesia

- PARAZOLI, R. The Behavior of Certain Reflexes of Peritoneal and Articular Organs in Various Types of Surgical Anesthesia 56
- NORTH, J. P. The Use and Abuse of Spinal Anesthesia 561

## PHYSICO-CHEMICAL METHODS IN SURGERY

## Roentgenology

- PFANZEL, G. E. and BRACKMAN, E. W. Further Observations on the Roentgen Treatment of Pituitary Tumors 57
- BEILCK, B. Roentgenological Visualization of the Epiphyseal Canal: Case of Hydrocystoma 55
- GRILL, A. A Contribution to the Clinical and Roentgenological Study of Postoperative Peptic Ulcer 55
- PFANZEL, G. E. and VANTURE, J. H. Roentgen Diagnosis and Treatment of Tumors of the Bladder 546
- CHADWICK, G. Palatal Combinations of the Brachiospinal Region and Their Treatment with Physical Agents 570
- BART, L. and RICHOUT, H. A Critical Study of Arteriography 553
- LEVET, J. The Dangers of Arteriography 554
- FISKE, W. B. The Roentgen Treatment of Carcinomas 56

ROCHERT, E. von. Three Years' Preliminary Experience in the Treatment of Cancer with Extremely Hard Roentgen Rays 564

MARTIN, H. E. The Fractional or Divided Dose Method of External Irradiation in the Treatment of Cancer of the Pharynx, Tonsil, Larynx, and Paranasal Sinuses 564

AFRECHER, G. Experimental Studies on Anesthesia with Regard to the Influence of Fracturing on the End-Results 564

MARTIN, J. M. and MARTIN, C. L. Modified "Coulard" Roentgen Therapy 564

## Radium

- LEVIN, I. The Relative Value of Surgery, Radium, and Roentgen Therapy in Carcinoma of the Breast 57
- HUTCHINGS, R. G. Interstitial Radium Treatment of Carcinoma of the Breast 57
- CHAMBERS, H. The Histological Classification of Cancer of the Uterine Cervix and the Relation Between the Growth Structure and the Results of Radium Treatment 577

## Miscellaneous

TEHRILL, W. J. LINDEN, A. WILSON, J. WOODS, R. B. and Others. Discussion on Short Wave Diathermy 568

## MISCELLANEOUS

- Clinical Entities—General Physiological Conditions
- O'SHAUGHNESSY, L. and BLAIR, D. The Etiology of Testicular Shock 568
- LEITCH, R. and LOCHHEAD, E. Heterotopic Ovarioepididymides Obtained with the Aid of Grafts of Bladder Mucosa in the Muscles or Grafts of Aponeurosis in the Bladder 567
- JUNG, A. and CRANTZ, S. Experiments on Heterotopic Ovarioepididymides in the Spleen 567
- NICHOLSON, G. W. Studies on Tumor Formation. XV. A Fetaloma Ovarian Teratoma 568
- MACLEOD, M. T. Heredity in Cancer and Its Value as an Aid in Early Diagnosis 568
- UCHIYAMA, R. Alkalemia Reaction of the Preparations of the Pituitary Body and the Urine of Cancer Patients 568
- BRACKMAN, E. New Studies on Latent Pathological Microbes in Tumors Removed from the More Common Operative Fields 570
- GORDON-TYLER, G. Rad. Surgical Risks 570
- RUTHERFORD, W. The Cause of Death in Fat Embolism 57
- General Bacteriology, Protozoa, and Parasitic Infections
- OUY, F. and LE BARS, L. Chronic Staphylococcus Septicopyemia with Prolonged Course 57

## Ductless Glands

- TABAKOW, M. Investigations on the Relation Between the Sympathetic Nervous System, the Blood Calcium, and the Parathyroids 572
- CAMP, C. The Influence of the Prostatic Glands on the Formation of Bony Callus 572

## BIBLIOGRAPHY

## Surgery of the Head and Neck

Head  
Eye  
Ear  
Nose and Sinuses  
Mouth  
Pharynx  
Neck

574  
574  
575  
575  
576  
576  
576

## Surgery of the Nervous System

Brain and Its Coverings, Cranial Nerves  
Spinal Cord and Its Coverings  
Peripheral Nerves  
Sympathetic Nerves

577  
577  
578  
578

## Surgery of the Chest

Chest Wall and Breast  
Trachea, Lungs, and Pleura  
Heart and Pericardium  
Esophagus and Mediastinum  
Miscellaneous

578  
578  
579  
579  
579

## Surgery of the Abdomen

Abdominal Wall and Peritoneum  
Gastro-Intestinal Tract  
Liver, Gall Bladder, Pancreas, and Spleen  
Miscellaneous

579  
580  
582  
583

## Gynecology

Uterus  
Adnexal and Peruterine Conditions  
External Genitalia  
Miscellaneous

583  
584  
585  
585

## Obstetrics

Pregnancy and Its Complications  
Labor and Its Complications  
Puerperium and Its Complications  
Newborn  
Miscellaneous

586  
587  
588  
588  
588

## Genito-Urinary Surgery

Adrenal, Kidney, and Ureter  
Bladder, Urethra, and Penis  
Genital Organs  
Miscellaneous

588  
589  
589  
590

## Surgery of the Bones, Joints, Muscles, Tendons

Conditions of the Bones, Joints, Muscles, Tendons,  
Etc  
Surgery of the Bones, Joints, Muscles, Tendons, Etc.  
Fractures and Dislocations

590  
592  
592

## Surgery of the Blood and Lymph Systems

Blood Vessels  
Blood, Transfusion  
Lymph Glands and Lymphatic Vessels

593  
593  
594

## Surgical Technique

Operative Surgery and Technique, Postoperative  
Treatment  
Antiseptic Surgery, Treatment of Wounds and In-  
fections  
Anesthesia  
Surgical Instruments and Apparatus

594  
594  
595  
595

## Physicochemical Methods in Surgery

Röntgenology  
Radium  
Miscellaneous

595  
596  
596

## Miscellaneous

Clinical Entities—General Physiological Conditions  
General Bacterial, Protozoan, and Parasitic In-  
fections  
Ductless Glands  
Surgical Pathology and Diagnosis  
Hospitals, Medical Education and History

596  
598  
598  
598  
598

## AUTHORS OF ARTICLES ABSTRACTED

- Achenbach, B 347  
 Adair, F L 337  
 Adams, A W 313  
 Ames, A 33  
 Andrews, W DeW 33  
 Armstrong, A 3  
 Barnes, E P 340  
 Bagdasarian, A 330  
 Baker, A H 37  
 Bazy L 338  
 Baldoeri, B 33  
 Bernabeo, L 330  
 Bracco, R 330  
 Calma, H 31  
 Calf C 373  
 Canbolin, V 334  
 Canelo, C K 3  
 Cannon, D J 330  
 Capovilla, L 343  
 Caltell, R B 330  
 Cecil, A B 347  
 Cerna, B 337  
 Chambers, H 337  
 Chang, L W 307  
 Charney, G 330  
 Castiglioni, X J 330  
 Doble, M 33  
 Davies, G E 336  
 Davis, M E 337  
 Deberch, L 33  
 Doley E A 330  
 Dolgopod, V B 34  
 Donald, C 3  
 Drasner, E M 330  
 Ducreyfort, R 33  
 Donald, Sir T 3  
 Drummington, J H 307  
 Elmacchi, E 337  
 Fadnow, A 335  
 Erney E S J 33  
 Echeba, J B 33  
 Fèvre, M 33  
 Fion, A 300  
 Furr W B 301
- Fitzgerald, J E 34  
 Fletcher, L M 33  
 Forty P 3  
 Frazer C H 33  
 Fried, B M 33  
 Gabriel, W B 330  
 Gilson, T E 343  
 Gordon-Taylor G 330  
 Grimes, H 330  
 Grubb, A 33  
 Haka, J 340  
 Hansen, J 347  
 Hayes, W L 343  
 Henschelmann, H 340  
 Hefer O 303  
 Hosen, J 337  
 Hosen, K 335  
 Howard, M E 343  
 Howard, R C 308  
 Hutchinson, R U 347  
 Hymna, H T 300  
 Isaac, J 3  
 Isaac Georges, P 336  
 James, M 333  
 Johns, E P 33  
 Jung, A 337  
 Kadzuka, B 33  
 Kallion, L A 3  
 Kozak, Z 300  
 Koen, J A 308  
 Kharach, M S 337  
 Kimberrough, J C 343  
 Kirets, T 338  
 Koudota, A 330  
 Labey F H 330  
 La Bara, L 37  
 Legault, R R 337  
 Leinhardt P J 300  
 Lepper E H 37  
 Leitch, R 307  
 Leveid, J 338  
 Levin, J 337  
 Loebe, P 333  
 Lamer H 330
- Lloyd Davies, O V 330  
 Lhama, J B 34  
 Lowley O B 338  
 Loebner, E 307  
 Mack, M 33  
 Mach, R 331  
 Mackin, M T 330  
 Macne, J P 307  
 Mahon, R 343  
 Martin, C L 304  
 Martin, H E 304  
 Martin, J M 304  
 Masmoodi, F 337  
 Marwell, J P 340  
 Mesopara, G 334  
 Menchen, G 304  
 Moore, R T 33  
 Moore, C R 330  
 Murphy, T N 337  
 Muro, D 340  
 Neostadter, M 314  
 Nicholson, G W 308  
 Norrander, E 334  
 Norik, J P 303  
 O'Brien, C B 300  
 Odette, D 334  
 Ogilvie, W H 336  
 O'Shaughnessy L 340  
 Ory, P 37  
 Overholt, R H 314  
 Pares, L 337  
 Paskaus, D 330  
 Pizzaghi, R 303  
 Pichler, C H 34  
 Parnow O 330  
 Piskler, G E 334  
 Pl, H T 307  
 Picher L B 334  
 Pullen, S 343  
 Puhla, A M 330  
 Ramsey A M 303  
 Rankin, P W 33  
 Reboul, H 338  
 Ricard, K 337
- Ragler L G 333  
 Rindone, A 333  
 Rogers, G 337  
 Rogers, W A 335  
 Roelckart, W 37  
 Sarnate, 316  
 Serna, E 338  
 Sennrich, J T 334  
 Schmitt, E 334  
 Schmitt, A 3  
 Schmitt, E von 304  
 Schmitt, W 343  
 Schwartz, A 333  
 Seiber, J 33  
 Sever J W 333  
 Sharpe, W C 319  
 Berg, J 333  
 Stone, D 306  
 Spectman, E W 37  
 Stone, C B 330  
 Struss, M 338  
 Tabachnick, M 37  
 Tala, G 341  
 Thelander, D 303  
 Tiley H 300  
 Tiroff, A B W 340  
 Tsalim Rao, G 340  
 Truett, P E 33  
 Tucker, G 331  
 Turner, W 335  
 Douzawa, K 330  
 Van der Linden, P 330  
 Verste, J H 340 340  
 Voss, V 309  
 Verpe, C 337  
 Wade, H 339  
 Warthen, H 300  
 Wilson, J 330  
 Winkler, F 338  
 Wolff, J A 338  
 Wolfman, H W 313  
 Woods, M B 335  
 Wright, G 334  
 Zollinger, R 330

# INTERNATIONAL ABSTRACT OF SURGERY

JUNE, 1935

## ABSTRACTS OF CURRENT LITERATURE SURGERY OF THE HEAD AND NECK

### HEAD

Theodoresco, D., and Hofer, O. Cancers of the Cheek (A propos des cancers de la joue) *Presse méd., Par.*, 1934, 42: 2040

According to the literature, carcinoma of the cheek is very rare and very malignant, its treatment is difficult, and the results are poor. The authors have studied 40 such carcinomata. As these were found among 700 buccal tumors, their incidence was 5.71 per cent. This practically agrees with the incidence given by Kuttner (5.63 per cent), but is considerably lower than that given by Channing (14.18 per cent). Leucoplakia is believed to be an important precancerous lesion. Most of the tumors reviewed had their origin on the buccal mucosa. Among them were a melanosisarcoma, a cylindroma, and a basal-cell epithelioma. They were of high malignancy. Early treatment is important.

On the basis of the statistics of Berven, Channing, Lund, and others and their own experience the authors believe that surgical treatment is far superior to radiotherapy. They state that the exposure should be wide. Block dissection of the lesion and the regional nodes is advisable. The cosmetic result is best when this is done through an incision made in the midline of the lip and chin and extended horizontally to expose the cervical nodes. Wide excision may necessitate the use of a cervical flap for repair. The lymphatics follow the facial vessels in close proximity to the periosteum of the mandible.

Of the 40 cases reviewed, operation was performed in 37. Lymphadenectomy was done in 30. In several, the mandible or maxilla was included in the resection. The authors favor immediate repair of the defect. Depending upon its extent, they repair it with adjacent tissues or with flaps from the head, neck, or elsewhere. To replace the mucosa they have used Thiersch grafts over a stent mold as suggested by Esser.

Regional anesthesia is generally employed, sometimes with avertin as a base. In the cases reviewed

the early mortality was 3 deaths. Two of these deaths were due to pneumonia and 1 was the result of septicemia. One of the patients who died of pneumonia had erysipelas. The late mortality was 70 per cent (26 deaths). Sixteen (43.2 per cent) of the patients developed a recurrence. Eighteen (48.6 per cent) remained free from recurrence during an observation period of from five months to fifteen years. Lymph node involvement has prognostic importance. Ten patients had no palpable nodes, 10 had soft palpable nodes, and 20 had hard palpable nodes. In 3 of the latter the nodes were adherent. In 11 cases restriction of jaw movement resulted from the operation and necessitated a secondary plastic procedure for its relief. In 5 of the 9 cases in which the best results were obtained no radiotherapy was given. THOMAS W. STEVENSON, JR., M.D.

### EYE

Ramsay, A. M. Clinical Science and Ophthalmology *Brit. M. J.*, 1935, 1: 239

The ophthalmologist is generally consulted because of ocular pain or some disturbances of vision. Ocular pain is usually a danger signal and may be of inflammatory or non-inflammatory origin.

Pain of inflammatory origin varies according to the site of the lesion. Superficial lesions cause pain of a sharp, cutting type which is aggravated by lid movements, whereas deep lesions cause pain of a throbbing or gnawing type which radiates along the branches of the trigeminal nerve and is most severe late at night or early in the morning. In the diagnosis consideration of the character of the pain in conjunction with other signs is of importance.

Before the development of physiological optics, non-inflammatory pain was classed with asthenopia and regarded as incurable. As long as asthenopia was studied by the observational method alone, no progress was made. The optical instruments invented by Helmholtz and the clinical studies published by Donders in 1864 demonstrated the abnormalities

responsible for it. Donders was able to accomplish so much because he was an ophthalmologist as well as a physiologist. Closer cooperation between the laboratory worker and the clinician results in improvement in the approach to clinical problems.

The retina is peculiarly susceptible to pathological influences. Accurate investigation of light and color sense may reveal the first indication of a disturbance of vision. The least amount of light capable of causing a sensation is the "light minimum," and the smallest perceptible increase in brilliancy of one of two lights is the "light difference." An increase in the light minimum is evidence that the rods and cones are defective. An increase in the light difference indicates a defect in the conducting system—the inner layers of the retina with the ganglion cells and nerve fibers. Of equal importance is the capillary supply. The rods and cones are supplied by the choriocapillaris, and the ganglion cells and inner layers by the capillaries of the retinal vessels.

The light minimum is always disordered in diseases which interfere with the circulation in the choriocapillaris, preventing normal regeneration of the visual purple. A decrease in the light minimum occurs with age and with the cumulative effect of toxic substances in the blood. In primary glaucoma it is one of the earliest signs. In the early stages it is transient like the attacks of dimness of vision and the appearance of colored rings around a light.

Night blindness is due to retinitis pigmentosa which may be hereditary and congenital. When it occurs in adults without the appearance of pigmentary changes in the retina it may be due to dazzling light exposure and malnutrition. It can be produced experimentally with a diet deficient in Vitamin A. Retinitis pigmentosa is a progressive disease resulting eventually in complete loss of vision. Royle has been able to give some relief by dividing the thoracic sympathetic trunk at the level of the second thoracic ganglion. If this operation has been suggested by Young, more feasible.

A patient who has a decrease in the light difference sees best in dull light. In bright light (whitish) flow most interfere with least. A double hemianopia of an increase in light difference is a central scotoma for red and green which, in sharp contrast to the blindness for blue characteristic of an increase in the light minimum. After the disease has progressed red is said to glitter like gold and green to look like silver.

A large proportion of cases the symptoms are due to overdilatation in tobacco and alcohol, but they occur also total blindness in cases they are due to the action of toxic substances. The patient is usually between forty and fifty years of age. The symptoms of the disease are usually of simultaneous onset in both eyes due to bilateral optic atrophy in toxic amblyopia. While the prognosis is favorable, much treatment is required for recovery.

When the function is lost, it is not affected by the primary cause. The eyes suffer and there is

danger of blindness. The latter of rods and cones is susceptible to every pathological influence and easily destroyed. The inner layers of the retina being more resistant, involvement of this conducting system is usually better. However when the nervous system is attacked, the inner layers may be destroyed and atrophy of the optic nerve takes place.

The distinction between a lesion of the functional unit and a lesion of the conducting system applies to other organs as well as to the eye and nerves. A reliable guide in prognosis and treatment in the eye, the two types of lesions may be distinguished by a physiological study of the light sense. An increase in the light minimum indicates a disease of the receptor system and causes night blindness, whereas a lesion of the conducting system results in an increase in the light difference causing the patient to be dazzled by bright light.

EDWARD S. PRATT, M.D.

O'Brien, C. H., and Laidler, P. J.: Unilateral Exophthalmos. *Am J Ophth* 33: 13, 1945.

Of eighty-two consecutive cases of unilateral exophthalmos, 5 (5.4 per cent) were due to orbital inflammation and 31 (32 per cent) to non-inflammatory changes.

Obstruction to the orbit occurred as a complication of suppurative sinusitis in thirteen cases, followed a perforating injury in one case and was associated with arteriovenous aneurysm in one case. Chlamydia was a complication of panophthalmitis in eleven cases and was associated with cavernous sinus thrombosis in two cases. Osteomyelitis occurred in two cases of paranasalitis in one case.

A rule inflammatory conditions were recognized with ease as the symptoms and signs are positive in their onset and progressed rapidly. Prompt increase rapidly from day to day, movements of the globe were limited, and pain and tenderness were present. The lids were red and often the bulbar conjunctiva was congested and chemotic, and occasionally purulent mass was seen or felt in the orbit. In a few cases discharging abscesses appeared in the lid or conjunctiva. Signs of congestion in the lids were rare. In some cases the temperature was elevated and there was an increase in the leucocyte count. Careful examination of the nasal accessory sinuses, the teeth and other regions of the head together with roentgenographic studies usually revealed the source of the infection. In four cases the source of the infection was found to be the orbit.

A neoplastic neoplasm either primary secondary or metastatic was present in the orbit in twenty-four cases and constituted the most frequent cause of unilateral exophthalmos. Carcinoma usually primary of the orbit but occurred in the orbit in one case. The growth of the tumor was rapid and the patient's vision was lost rapidly. Metastatic carcinoma of the orbit entered the orbit from the systemic circulation or other sources.

parts, but occurred also as a metastatic growth. It was found only in adults, grew quite slowly, and involved the regional lymph nodes. It infiltrated bone in some of the cases. Neoplastic diseases of the hæmatopoietic tissues were responsible for several orbital tumors, viz., undifferentiated hæmatopoietic tumors composed of cells of an early embryonal type, malignant lymphomata, tumors associated with myelogenous leukaemia, and tumors occurring as a manifestation of acute leukaemia. Blood studies were a means to diagnosis in some of the cases of this type but not in all.

Benign neoplasms were found in ten cases. The most frequent benign neoplasm was the meningioma. This tumor grew very slowly and, except in the late stages, gave rise to few symptoms. In the roentgenograms made in cases of meningioma there were evidences of hyperostoses in the anterior or middle cranial fossa or in the orbit. Among other benign tumors encountered were a glioma of the optic nerve, a granuloma, a hæmangioma, a neurofibroma, an adamantinoma, and a chondromyxoma.

Trauma followed by an orbital hæmatoma, rupture of the carotid artery into the cavernous sinus with pulsating exophthalmos, or orbital emphysema occurred in eight cases. In orbital hæmorrhage the proptosis developed rapidly and subsided slowly without other symptoms. In arteriovenous aneurism the typical signs of pulsating exophthalmos were present. In emphysema the onset was sudden and crepitation was elicited in the lids.

Mucocele of the frontal sinus was present in three cases. The proptosis developed slowly and the globe was displaced laterally and downward.

Exophthalmic goiter occurred twice. The proptosis was unilateral, but the other common ocular signs were present in both eyes. In one case there was a high degree of unilateral axial myopia with pseudoproptosis.

In 3 cases the cause was undetermined.

Non-inflammatory lesions of the orbit accompanied by proptosis were sometimes difficult to diagnose. Frequently in cases of such lesions tissue examination was necessary to determine the cause. The history was of importance, especially in cases of trauma or metastatic tumor. Signs of inflammation were absent although pain was sometimes present and occasionally the lids were oedematous or even hæmorrhagic. Frequently a visible or palpable mass was detected in the orbit and the globe was displaced laterally or vertically as well as forward. Ocular rotations were usually limited in one or more directions. Roentgenograms were of assistance in many cases. While they sometimes failed to show evidence of a tumor mass, they frequently disclosed signs of pressure, bone infiltration, bone erosion, or hyperostoses when they did not outline the neoplasm. A general physical examination, including blood and other laboratory studies, should always be made, since in a few of the cases reviewed it was the sole means of diagnosis.

LESLIE L. MCCOY, M D

Chang, L W Dislocation of the Lens *Chinese M J*, 1934, 48 916

Dislocation of the lens is rare. It may be either congenital or acquired. When congenital it may also be hereditary, it is always bilateral, and the lenses are never displaced downward. Adams reported a case of downward displacement and Page a case of unilateral ectopia of the lens. In a period of four years the author observed four cases of congenital and three cases of acquired dislocation. The results of treatment in these cases were unusually good.

VIRGIL WESCOTT, M D

Pi, H T Subcapsular Cataract in Osteomalacia *Chinese M J*, 1934, 48 948

Cataract is often associated with postoperative tetany and with the so called idiopathic tetany with changes in the hair and finger nails, caries of the teeth, and diminished bone growth. Tetany may occur in infants with or without rickets and in adults with and without osteomalacia, but the relationship between cataract, tetany, and osteomalacia has not always been recognized. The author reports three cases of subcapsular cataract associated with osteomalacia.

VIRGIL WESCOTT, M D

Pi, H T Cataract Among the Chinese *Chinese M J*, 1934, 48 928

The author states that operations for cataract are infrequent in China because the Chinese seldom live to the cataract age, it being rare for them to attain the age of seventy years, they are cautioned in early life that operations on the eyes are dangerous, and at the age of sixty years they feel so near death that they make no effort to improve their physical condition. Senile cataract is seen from five to ten years earlier in China than in Japan or Germany. Cataract is probably more common in women than in men, but for social reasons fewer women appear at the clinics.

VIRGIL WESCOTT, M D

Dunnington, J H, and Macnie, J P Detachment of the Retina. Operative Results in 150 Cases *Arch Ophth.*, 1935, 13 191

The operative results in 150 cases of retinal detachment are analyzed. There were 197 operations on 155 eyes. Sixty-four per cent of the patients were males. The ages ranged from five to seventy-five years and averaged thirty-nine and eight-tenths years. There was a positive history of trauma in 30 per cent of the cases and a suggestive history of trauma in 11.3 per cent. Myopia was present in two-thirds of the cases. In 36.6 per cent it was 6 diopters or more.

Severance of the rectus muscles with subsequent reattachment rarely produced any significant muscular imbalance. No permanent effect on the intraocular tension was noted. Marked hypotony was found to be a grave prognostic sign. A postoperative change in the lens was rare. Frequently some impairment of the field remained after successful operative procedures. A cure was obtained in about 50



per cent of the cases with detachment of about half of the retina but in only about 5 per cent of those with detachment of three-quarters of the retina. The inferior part of the retina was found detached about twice as frequently as any other part. Detachments without demonstrable tears were cured nearly as frequently as those with one or more holes. The treatment was followed by cure in 38 per cent of the cases, improvement in 98 per cent, and failure in 58.8 per cent. Just as successful results were obtained with the chemical coagulation of Guist and Lindner as with the electrocoagulation method of Walker. The authors believe that cure requires extensive treatment of the affected area.

WILLIAM A. MANN, J. M.D.

### RAR

Howard, R. C. The Window Operation for Hernia terna Auris and Perichondritis with Effusion. *Laryngoscope*, 935 45 8

Howard states that in cases of hematomas, fluid formations, and chronic masses between the perichondrium and the cartilage of the ear satisfactory results may be obtained by forming a window for prompt evacuation and free drainage by removing a piece of tissue consisting of perichondrium and a full thickness of skin by means of a punch or other suitable cutting instrument. JAMES C. BRANTLEY, M.D.

Fine, A. Oculomotor Nerve Spasm in Gradenigo's Syndrome. *Arch Otolaryngol* 935, 42.

In 1904 Gradenigo described a syndrome consisting of acute otitis media associated with pain in the head and paralysis of the sixth nerve on the same side. The otitis may be an exacerbation of chronic otitis without signs of mastoiditis, or the syndrome may occur during convalescence from a mastoid operation. The syndrome is due to pressure on the nerves by localized serous meningitis at the apex of the petrous pyramid. The pain in the head is due to pressure on the gasserian ganglion and may be distributed to any of the regions supplied by the fifth nerve. Diplopia and paralytic internal strabismus develop as the result of sixth nerve paralysis. The second, third, fourth, and seventh nerves are involved only when there is a complicating sinus thrombosis, brain abscess, or diffuse suppurative meningitis, but occasionally disturbance of one of these nerves may develop without clinical evidence of an intracranial complication. Therefore the eye of the patient with Gradenigo's syndrome should not be regarded *per se* as an indication for surgical intervention unless there is other well-defined evidence of intracranial involvement. Papilloedema and involvement of the facial nerve have also occurred in cases which cleared spontaneously.

The trochlear nerve, which supplies the superior oblique muscle and gives rise to vertical diplopia when affected, is the least frequently involved of all the oculocranial nerves. The third nerve also is seldom involved by pressure phenomena, the reason

being its short and comparatively sheltered course at the base of the skull. This nerve arises from the medial surface of the cerebral peduncle, pierces the dura at the middle cranial fossa, and immediately enters the lateral wall of the cavernous sinus, where it is in close relation to the fourth nerve and the ophthalmic branch of the fifth. It then enters the orbit through the superior orbital fissure after dividing into a superior and an inferior branch. Involvement of the third nerve in Gradenigo's syndrome which is frequent, results in spasm of the homolateral internal rectus muscle which may begin as early as the first week after paralysis of the abducens.

If in the primary position of the eye, the paralytic eye turns toward the nose, spasm of the internal rectus muscle is already present. In the presence of spasm the paralytic eye moves more rapidly than the other eye in adduction of the spastic internal rectus. A study of the diplopic fields shows that diplopia is most marked when the patient looks in the direction of the paralyzed external rectus, but is present also when he looks in the direction opposite the field of action of this muscle. This indicates that the diplopia is due to spasm of the homolateral internal rectus muscle.

In the differential diagnosis it is necessary to take into consideration the possibility of bilateral involvement of the sixth nerve, in which condition diplopia and internal strabismus are less marked in the primary position than when the eyes look either to the right or the left. EDWARD S. PLATT, M.D.

Keen, J. A. Clinical Observations on Chronic Deafness in Children. *J Laryngol & Otol* 934, 40 783

Keen reviews thirty-two cases of chronic deafness in children in which the chief method of treatment was the electrophonoid method of Zund Burgert. The deafness was due to chronic suppurative otitis media, chronic middle ear catarrh, or otosclerosis. In the cases of the first type the ears were free from discharge before treatment was begun. Of fifteen cases, nine were treated by the electrophonoid method and six were used as controls. After seven years the condition was worse in five of the six untreated cases but improved in all of the treated cases.

In the cases of the second type the deafness had persisted after the usual methods of treatment. There was never any discharge, and the drum membranes were intact. Improvement occurred in all of those treated by the electrophonoid method but in only two of the four controls.

In the cases in which the deafness was due to otosclerosis the drum membrane was normal. The deafness may have been of the inner ear or congenital type. In this series there was no striking improvement in the treated cases.

The patients were under observation for from seven to ten years. Once a year the hearing was tested by the conversational and whispered voice and graphs were made. JOHN F. DUNN, M.D.

NOSE AND SINUSES  
Tilley, H Chronic Pyogenic Inflammation of the Antrum and Other Accessory Sinuses *J Laryngol & Otol*, 1935, 50 1

Following a brief résumé of the normal anatomical relationships of the sinuses and a description of the normal nasal mucosa, Tilley presents a detailed discussion of the problem of chronic sinus infection in the adult supplemented by numerous photomicrographs and illustrative case histories. He discusses particularly the defensive ciliary action of the mucosa. To denote transmission of infection by way of the lymph channels and blood stream he uses the term "vascular convection."

Histopathologically, five types of infection of the nasal accessory sinuses are recognized: the oedematous, the infiltrative, the fibrotic, the cystic, and a new type in which the infection involves the peristosteum and passes by way of the vascular channels to the bony sinus capsule. These types are not easily distinguished clinically as one merges into the other. The infiltrative type is the most common and the infective osteitis type the most serious. An example of the latter is the diffuse spreading osteomyelitis of the frontal bone.

In discussing the operative treatment of chronic maxillary sinusitis Tilley advocates the Caldwell-Luc operation for all cases except those of the simple oedematous type. He attributes recurrence after a well-executed sinus operation to a residual infection in the bony tissues surrounding the sinus. He states that until this infection is eliminated recurrences and focal symptoms will persist. JOHN F. DELPH, M.D.

MOUTH

Veau, V The Skeleton of Harelip (*Le squelette du bec-de lièvre*) *Ann d'anat path* 1934, 11 873

The bony defects present in complete unilateral and bilateral harelip are described and shown by illustrations. Veau has studied thirty-one skulls with such lesions and serial sections of the skulls of six fetuses from five to eight months of age.

Characteristic of complete bilateral harelip is enormous projection of the intermaxillary bone due partly to elongation of the vomer but chiefly to deformity of the intermaxillary bone. Recession of the superior maxilla may make the projection more apparent. There are four incisors in the median tubercle. The lateral incisors are lost early because they are poorly implanted and their blood supply is imperfect. While the incisors are in a vertical plane although they project forward, they are useless for mastication because they are separated from the inferior incisors by more than 1 cm. The vomer and intermaxillary bones may project straight forward, but the axis is usually curved because of the pressure of the bridge of soft parts at the level of the nose. The author supplements his description with drawings of eight frontal sections of an eight month fetus.

The lesion is essentially the same in unilateral as in bilateral harelip, but the skeletal changes are very

different because in unilateral harelip the vomer and median tubercle are acted upon by the natural forces of the normal side and, as a result, the median axis is considerably distorted. The author presents drawings of two twins of 165 mm which demonstrate the distortion. He compares a set of serial sections taken in the frontal plane and a set taken in the horizontal plane with a few normal sections. In the normal sub-ject the intermaxilla is situated in the frontal plane. In the deformed it is in the sagittal plane and is progressively dislocated from the inferior margin of the septum away from the side of the cleft. Veau calls attention to the deep groove where the nasal mucosa normally turns from the septum onto the palate because, in the repair of the floor of the nose which is generally necessary, the mucosa in this region should be freed.

Part of the vault in cleft palate is covered by mucosa which normally should form part of the floor of the nostril on the cleft side. The nostril on the cleft side is generally obstructed by the hypertrophic inferior turbinate. The author presents horizontal sections showing the great deviation of the septum toward the cleft side, and several other sections showing variations in the arrangement of the suture lines and teeth in unilateral cleft palate. In conclusion he states that complete harelip sometimes occurs without cleft palate and occasionally with only minor bone changes. THOMAS W. STEVENSON, JR., M.D.

NECK

Kecskés, Z The Advantages of High Tracheotomy (*Ueber die Vorteile des oberen Luftroehrenschnittes*) *Orvosi hetil*, 1934, p 986

According to the Lénárt Nose and Throat Clinic at Budapest, high tracheotomy should be chosen for the adult and low tracheotomy for the child. This viewpoint is based on 226 tracheotomies which were done in the last few years. The operation is performed under local anesthesia, never under narcosis. An oval window of the diameter of the cannula to be introduced is cut in the wall of the trachea. The high tracheotomy, which is more rapid, is recommended also for emergency cases. The anatomical conditions are more favorable for the high operation. At the level of the first to third tracheal rings the trachea is superficial, while at the site at which the low operation is performed it lies from 5 to 6 cm below the skin and in front of it are large veins which in dyspnoea may be dilated to the size of the little finger. Often, the arteria anonyma crosses the trachea very high up. The arteria thyroidea ima is present in 10 per cent of the cases. In the cases of children the possibility of an enlarged thymus must also be considered.

In the cases of short-necked persons the low tracheotomy is often impossible as the fourth and fifth tracheal rings are behind the sternum. Complications are more frequent following the low tracheotomy. Secondary hæmorrhage occurs in 81 per cent of the cases in which this operation is done (Eske), but in only 19 per cent of those in which the

high operation is performed. Wound infection is also more frequent after the low tracheotomy. In the high operation the short cannula fits the axis of the trachea better. Its initial changing being therefore easy and operative accidents are more easily avoided. (J. Lusk). Joux W. Barr, M.D.

Caselo, C. K., and Lissner, H. Two Cases of Chlid Hood Myxodermia Reported for the Purpose of Emphasizing the Importance of Bone-Age Studies. *Radiocutology* 931 9

In reporting two cases of juvenile hypothyroidism the authors present a series of roentgenograms of the wrist of one of the patients which showed extreme osseous retardation before treatment and marked osseous development during two years of thyroid therapy. They urge the use of bone age roentgen-ray studies in cases of suspected hypothyroidism. They cite the work of Engelbach and Shetton and present a classification of conditions associated with premature and retarded ossification.

PAUL STARR, M.D.

Kallen, L. A. Vicious Vocal Mechanisms. The Anatomy, Physiology and Development of Speech in Laryngectomized Persons. *Arch Otolaryngol* 934, 90 460

Kallen states that improvement of the technique of arylaryngotomy of the larynx has resulted in increasing interest in methods of restoring voice to persons subjected to that operation.

The disadvantages of the prostheses formerly used were irritation of the tissues, shrill or squeaky sounds, respiratory complications, inflation, pain and fatigue on speaking, prohibitive cost, and occasional failure of the apparatus to work. The author claims that there is hardly a person subjected to total laryngectomy who within short time, could not be taught to develop fairly loud voice amenable to a certain degree of modulation and superior to the sound produced by mechanical device.

The purpose of vocal therapeutic measures after laryngectomy is to develop a vicarious reservoir for air which may be subjected to compression in such way that some anatomical structure capable of functioning as a vicarious glottis may be activated by it. The anatomical structures offering possibilities for the development of a vicarious air chamber vary in location from the stomach to the oropharyngeal opening (cricopharyngeus muscle).

It is believed that under normal conditions the gastric air bubble facilitates the entry of food into the stomach, regulates spatial capacity and regulates pressure between the lower portion of the stomach contracts. By some checks the swallowing of air is advocated. The author advocates aspiration of air into the oropharynx for the purpose of phonation. The air bubble may act also as pneumatic cushion. In addition to the stomach, the hypopharynx may serve as vicarious reservoir of air. The various anatomical structures which may serve in the formation of a vicarious glottis are the dorsum of the

tongue and the tense velum palatini, the base of the tongue, the posterior wall of the pharynx, the posterior pillars of the fauces, the palatine ridges, the inferior constrictor of the pharynx, the epiglottis, the two lateral pharyngeal bands, the external folds of cricopharynx with its associated tissues (cricopharyngeus muscle) and the mouth of the oropharynx.

Two stages are differentiated in the production of oropharyngeal speech oscillance (opening up) of the oropharynx before phonation occurs and oropharyngeal contraction during phonation. Air or rush into the oropharynx only after its mouth is open. Since, under normal conditions, the oropharynx remains closed during inspiration, the laryngectomized person must learn the method of effective aspiration of air by conscious sensibilities. Whenever possible, the surgeon should preserve mucous membrane and a favorably placed muscular band, muscle, or muscular rimma as they may serve as basis for the development of a pseudoglottis. It is suggested that the transplantation of its folds of mucous membrane or muscular strips in the mesopharynx or hypopharynx may provide a structure which later might develop into a pseudoglottis dependent upon their capacity to vibrate. It is important to spare the fibers of the cricopharyngeus muscle and to protect the sternohyoid and thyrohyoid muscles from surgical harm.

Thus a thor classifies pseudo-voices into four groups: (1) the pseudo-whispered voice, (2) the pharyngeal voice, (3) the oropharyngeal voice, and (4) the gastric voice. Normally whispering occurs when the expiratory breath current flows through the posterior portion of the rima, making an opening of varying size which is shaped like a triangle. The laryngectomized subject who "pseudo-whispers" cannot form independent vowels. He can merely indicate them. He does this by assuming the oral posture involved. Actually he produces the consonants. It is best for the patient subjected to laryngectomy not to attempt the pseudo-whisper as it may become habitual and render vocal methods difficult. The so-called pharyngeal voice is that of the patient whose vicarious glottis lies in the mesopharynx or hypopharynx. The oropharyngeal voice differs in mechanism and acoustic quality from the pharyngeal voice and is the aim and end of vocal therapy after laryngectomy as it permits satisfactory volume modulation, and fluency. The gastric voice is often used by ventriloquists. This is the so-called "belly-clap" type of voice. The sound is made by exertion from the stomach combined with articulation and is sufficient to produce speech.

The author discusses the respiratory function and variations in speech, the rôle of the diaphragm in vicarious respiration, speech melody in the laryngectomized, variations in vocal mechanisms, and therapeutic measures for the development of vicarious voice. The technique of the development of vicarious voice is dependent upon two processes, deglutition of air (aerophagia) and aspiration of air into the stomach. Kallen outlines vocal gymnastic pro-

gram. The results of this program are dependent upon the intelligence, adaptability, skill, other qualities of character, and general condition of the patient. The program includes reconditioning of phonic respiration, the production of sounds and syllables, aids to the production of eructus, the practicing of articulations and their combinations, reading and modulation exercises, and movement of the head and neck to aid in the development of the pseudoglottis.

The prognosis in vocal therapy is dependent upon the psyche of the patient. As a rule it is favorable. The wound produced by total extirpation of the larynx heals completely within about six weeks. Phonetic therapy should be instituted immediately after healing. The mechanical device does not replace an inherent biological function. It does not become an integral part of the patient's psyche. It remains, at best, a useful machine never identified with his personality. The aim of all vocal gymnastic therapy after laryngectomy is to aid the patient to live as normal a life as possible.

ALTON OCHSNER, M D

Tucker, G. Cancer of the Larynx. Observations in 200 Consecutive Cases. *Arch Otolaryngol*, 1935, 21, 1.

Tucker reviews 200 consecutive cases of cancer of the larynx which came to the bronchoscopic clinics of the University of Pennsylvania and were treated by several surgeons or roentgenologists.

Only 2 per cent of the patients were negroes. Forty-one per cent had used the voice excessively,

and 12 per cent had used tobacco excessively. All of this group had hoarseness and local discomfort. Twenty-two per cent had dyspnoea, and 58 per cent dysphagia. Local or referred pain was present only when the disease was advanced.

X-ray examination yielded evidence of a lesion in the larynx in practically every case. Correlation of the findings of X-ray examination, mirror examination, and direct examination permits an accurate determination of the location and extent of the lesion. Biopsy was done in all of the cases reviewed. In none were there any untoward effects or indications of metastatic spread resulting from this procedure.

Ninety-five per cent of the lesions were squamous cancers. Seventy-two per cent were probably of intrinsic origin, a type of lesion which is amenable to surgical treatment if it is diagnosed early.

In 58 of the cases laryngofissure was performed. In 14 per cent of these the lesion recurred in two years.

Of the 31 cases in which total laryngectomy was done, recurrence developed in 37 per cent.

Partial laryngectomy with laryngostomy and maintenance of the opening for one week for the intralaryngeal application of radium was performed in 17 cases.

In 54 cases X-ray and radium treatment were given. Because of the difference in the methods used, no estimate of the results of the irradiation is possible. However, 3 patients who were treated only by irradiation are still alive after three years.

HARRY C. SALTZSTEIN, M D

# SURGERY OF THE NERVOUS SYSTEM

## BRAIN AND ITS COVERINGS; CRANIAL NERVES

Cabre, H., and Donati, C. The Diagnosis and Treatment of Abscess of the Brain. *J Laryngol. & Otol.*, 1915 50 73

Following a discussion of the various methods of treating abscess of the brain, the authors describe their own procedure in thirty cases. In twenty three of the latter operation was performed. Ten of the thirty patients recovered.

The authors contend that complete removal is the only satisfactory treatment for thick walled chronic abscess, and express doubt as to whether an abscess should be operated upon in the acute stage. They emphasize that not more than 5 cm of cerebrospinal fluid should be removed in diagnostic spinal puncture. In their method of exploration for an abscess the scalp is infiltrated with 1 per cent novocain and a burr hole 5 cm in diameter is made in the skull at the site of the suspected abscess. The dura is then opened and the brain explored with graduated brain needles. A distinct resistance indicates that the capsule of the abscess has been encountered. It is important for the needle to enter the abscess cavity at right angles and at its uppermost part. If necessary another burr hole should be made to permit the needle to be introduced directly rather than obliquely into the brain. The escape of a few bubbles of gas indicates that the top of the cavity has been entered.

The usual open and closed methods for drainage are discussed. The after-treatment indicated is the same, regardless of the method of draining the abscess. The authors emphasize that dressings should be done infrequently unless a complication develops. In their cases the first dressing is usually done at the end of ten days. The patient should remain in bed for several weeks after the operation.

The most common complications in the authors' ten cases with recovery were a rise in the temperature, edema, meningitis, incomplete drainage, recurrence, and epilepsy. Fits occurred during the first few weeks after operation in four of the cases of recovery but in only one did they continue after the patient's discharge from the hospital.

The authors review the common errors made in the diagnosis and treatment of abscess of the brain. They believe that the end-results would be improved if the history were carefully considered and neurological examination and an examination of the visual fields were made in cases of severe headache after ear trouble or mastoid operation. They state that when intracranial complications are suspected neurological investigation should take precedence over mastoidectomy. ROBERT ZOLLINGER, M.D.

Schjett, A.: Suprasellar Craniopharyngioma (Suprasellar craniopharyngioma). *Med Rev* 1934, 5 505.

As a rule tumors of the anterior lobe of the hypophysis produce the chiasma syndrome. This is essentially a temporal hemianopia accompanied by destruction of the sella turcica which is visible in the roentgenogram. The chiasma syndrome may be produced also by tumors of other kinds, especially so-called craniopharyngiomas. The latter lead, not to destruction of the sella turcica, but merely to atrophy involving especially the chiasmal processes. The author reports such a tumor. It belonged to the clinical group of suprasellar neoplasms.

The anterior lobe of the hypophysis arises from an out-pocketing of the embryonic oral cavity and is therefore of ectodermal origin. At the end of this out-pocketing there appears closed ends which is the Anlage of the anterior lobe of the hypophysis. The pedicle of the vesicle is the craniopharyngeal canal. Normally this disappears later. Behind the Anlage of the anterior lobe there develops an out-pocketing of the mid brain which becomes the posterior lobe. After the craniopharyngeal canal has regressed the hypophysis remains attached only to the brain. The craniopharyngeal canal persists in 1 per cent of adults. It may persist in part or in whole. It may come down from above and terminate in the body of the sphenoid or the posterior part of the nasal septum. It may contain hypophyseal tissue. If a tumor arising in the craniopharyngeal canal grows upward and emerges at the sella turcica, it becomes a suprasellar tumor clinically and produces the chiasma syndrome. The roentgen picture often shows calcareous deposits.

In the author's case, that of a girl eleven years of age, there were disturbances of the vision and headaches, and the roentgenogram showed a shadow the size of a plum above the sella turcica. The shadow was due to small calcareous granules. The presence of increased intracranial pressure was evidenced by flattening of the digital impressions. The tumor was operated upon by Oberechtsen. The chiasma was exposed from the right side. By sacrificing the right optic nerve, the function of which had been almost destroyed, it was possible to remove most of the tumor and relieve the pressure on the left optic nerve, which still functioned fairly well. After recovery concentric diminution of the visual field was found. (BORTHENADOT) JOHN W. BAKER, M.D.

Mahler, G. L., and Spackman, E. W.: Further Observations on the Roentgen Treatment of Pituitary Tumors. *Am J Roentgenol* 1935 23 14

The relative value of surgery and irradiation in the treatment of pituitary tumors has not been de-

terminated definitely and varies in different cases. Of importance in the selection of the treatment is co-operation between the neurologist, surgeon, and radiologist. When operation offers a reasonably fair chance of success, roentgen therapy is to be regarded as the second choice. When the tumor mass cannot be removed completely, hope of preventing regrowth must depend on irradiation. When the indications for operation are questionable, the patient's general condition is not favorable, or the patient refuses surgery, roentgen irradiation is of the greatest value. Initial irradiation therapy given by a competent radiologist is less hazardous than indifferent surgery. If unsuccessful, it does not interfere with operation unless it is prolonged beyond reason. In far-advanced cases in which surgery cannot be considered, roentgen therapy usually offers the only hope of palliation.

Twenty-one cases of pituitary tumor treated by irradiation alone or in conjunction with surgery are presented. The neoplasms included pituitary adenomata, a suprasellar tumor, a cystic pituitary tumor, malignant disease with extensive involvement into and about the pituitary region, and tumors the exact nature of which could not be determined. The clinical and roentgen findings are described at length and the results obtained in each case are discussed. The results were best in the cases of solid pituitary tumors. Improvement of the visual disturbances was a feature in all of the favorable cases, and relief of headaches was obtained in the majority. The article is concluded with the following statements:

1. Roentgen irradiation is to be recommended as routine treatment for pituitary tumors.

2. Consultation of the radiologist with the surgeon and neurologist is essential in all cases.

3. We believe that we do no harm and do not delay a favorable outcome by giving 200 per cent of the erythema dose, 1,600 r, through the usual three areas, but that if no response is noted after this much treatment, operation should be performed as in all of our cases amenable to roentgen treatment we obtain considerable expansion of the fields of vision at this stage.

4. This treatment can easily be given within two months, and in no way interferes with surgical procedure.

5. If the fields of vision and the clinical symptoms show a satisfactory response, we believe the case may be treated without recourse to surgery.

6. We recommend examination of the fields of vision monthly during the active stage of treatment and at least once every three months when the visual fields appear to show no further changes.

7. We have stopped treatment as the fields approached the normal limits.

8. We have given as high as from 8 to 10 erythema doses to each skin portal, and by carefully limiting the area of the field, have avoided unfavorable results.

9. If the fields of vision begin to show contraction or the clinical symptoms increase in spite of roentgen treatment, the patient should be operated upon.

10. The total dosage should be carefully watched.
11. Postoperative roentgen therapy is strongly recommended for every case in which there is any doubt regarding complete removal of the tumor.

ADOLPH HARTUNG, M.D.

Frazier, C. H. The Surgical Management of Chronic Subdural Hæmatoma. *Ann. Surg.*, 1935, 101: 671.

A syndrome which is pathognomonic of subdural hæmatoma consists of headache, somnolence, yellow spinal fluid, and a history of injury to the head. The author reports six cases. He found headache to be the most common and somnolence the next most common symptom. All other neurological symptoms were inconstant. Inequality of the pupils was found in only three cases and well-defined papilloedema in only one case. The disks were blurred in two cases and normal in three. Focal symptoms were present in only three cases. In one case the pyramidal tract signs were homolateral. Homolateral pyramidal tract signs may be due to (1) pressure of the crus on the incisura tentorii, (2) pressure of a contralateral dilated ventricle, or (3) pressure of the contralateral hemisphere against the cranial wall. The spinal fluid was examined in only four of the reported cases. In two it was yellow and in two it was colorless. The spinal fluid pressure was increased in two and normal in two. The protein content of the fluid was increased in three and normal in one.

Quite often (in 50 per cent of the cases reported by the author) ventriculography or encephalography is necessary for diagnosis or localization.

The hæmatomata were bilateral in three of the author's cases and unilateral in three. Bilateral hæmatomata occur most frequently following a blow on the back of the head. Subdural hæmatomata are usually found in the frontal and parietal regions, but occasionally they extend from the frontal to the occipital pole. The mechanism whereby an injury to the back of the head causes the rupture of a vulnerable vein has been explained by Trotter. The brain is not protected against anteroposterior movements as it is by the falx against transverse displacement. The cerebral veins passing from the brain to the tributaries of the longitudinal sinus are short trunks passing directly from the brain to the dura at right angles. The cranial end of the vein being firmly fixed by the dura and the cerebral end attached to the movable hemisphere, rupture can be readily produced by a sudden jarring movement which causes an anteroposterior displacement.

Within a short time (few days according to Spiller), the hæmatoma becomes enveloped in a characteristic greenish membrane. In removing the hæmatoma by the suction method it is important to leave the membrane intact. At first, the clot may be of a gelatinous consistency. Later, it undergoes liquefaction. The fluid is dark blue, coffee colored, or greenish yellow. As the clot has usually become liquefied by the time operation is undertaken, Flem-

ing' dual perforation, suction-irrigation operation is the procedure of choice. In this operation two perforations are made from 6 to 8 cm. apart, first on one side of the midline and then on the other, one in the postfrontal region and the other in the parietal region. They are so placed that they may be utilized in the formation of an osteoplastic flap if necessary. Irrigating fluid is introduced through the frontal perforation and removed with the accumulated blood by suction through the parietal perforation. This process is continued until the hematoma has been evacuated. Because of the high incidence of bilateral hematomata, bilateral exploration is recommended.

D. VAN JOUY DEBARTATO, M.D.

Doldgopol, V. B., and Neustadter, M. Meningo-Encephalitis Caused by Cysticercus Celluloseus. *Arch. Neurol. & Psychiat.* 1933 33 3

Cysticerci, the larvae of several intestinal tape worms, are frequently encountered in the muscles of various domestic and wild animals. Cysticercus celluloseus, the larva of *Tenia solium*, is the common organism affecting the eye and other organs of man, but several cases of infection of the eye by the cysticercus of the bovine tapeworm are known. The cysticercus found in the brain is apparently always the cysticercus celluloseus.

Cysticercosis of the brain is the most important form of infestation because of the gravity of its prognosis. The diagnosis is difficult because of the absence of characteristic signs and because of the variability in the site of the lesion and its frequently disseminated character. The diagnosis is most often made at autopsy.

The authors report a case of cysticercosis of the brain which came to operation and autopsy. The illness began one year before the patient's admission to the hospital with constant headaches radiating from the frontal to the occipital region. Five months later vision in the left eye became blurred and the patient complained of seeing red and blue lights. A few weeks later vomiting and convulsive seizures of the left arm and leg occurred. With subsidence of the symptoms, vision in the right eye became blurred while vision in the left eye began to improve. Lumbal puncture at the New York Eye and Ear Infirmary revealed a pressure of 440 mm. of water, a meningeal colloidal gold curve, and 100 white cells per cubic millimeter. 5 per cent of which were eosinophiles. No parasites or ova were found in the feces. The patient was transferred to the Central Neurological Hospital. The findings of the neurological examination are reported in detail. Despite negative Wassermann and Kahn reactions of the blood and negative Wassermann reaction of the spinal fluid the symptoms were attributed to retrobulbar gumma. Because of eosinophilia in the blood (5 per cent), detailed cytological examination of the spinal fluid was made. The findings of this examination were 10 cells per cubic millimeter eosinophiles, 76 per cent neutrophils, 24 per cent and lymphocytes, 50 per cent. These observations

led to the suspicion of parasitic infection of the meninges or brain. Examination of the cerebrospinal fluid for hooklets and of the feces for ova was negative. The diagnosis of retrobulbar gumma, with gummatous meningitis was therefore maintained and antisyphilitic treatment was given.

Four months after the patient's admission to the hospital no eosinophiles were found in the cerebrospinal fluid or the blood. One month later Jacksonian attacks developed. These attacks were limited to the right side and were preceded by paresthesia of the right extremities. The neurological condition remained about the same until two weeks later when the visual fields were constricted and central scotomata were found on both sides. A short time later the patient had a general tonic convulsion with loss of consciousness which lasted for about three minutes. Following this attack vision failed rapidly until it was limited to the counting of fingers. There were complete primary optic atrophy on the right and marked papilloedema on the left. Testing of the pupillary reflexes was not done as mydriatic had been administered. The ocular movements were intact. There was no nystagmus. The corneal reflexes were present and the pharyngeal reflex as absent. Other neurological signs were only slightly altered. Because of the threatened blindness, right subtemporal decompression was decided upon. A tentative pre-operative diagnosis of sarcomatosis of the base of the brain was made.

On December 8, 1933, an opening 2 in. wide was made in the right temporal region. The dura and brain bulged through it. A small tumor mass was found on the under surface of the dura and removed. The anatomical diagnosis was meningioma.

On the day after the operation there was paralysis of the left side of the face and body and Babinski reflex was present on the left. The paralysis of the leg subsided the following day but that of the arm and face remained unchanged. Four days later there was complete anisocoria with primary optic atrophy on the right and complete secondary atrophy on the left. Two weeks later a small purulent discharge appeared in the wound and was followed by chills and a rise in the temperature to 103 degrees F. The patient died one year and nine months after the beginning of the symptoms.

The findings at autopsy are reported in detail. A heavy plastic crust was present in the lower surface of the brain over the peduncles, the pons, and the medulla and apparently extended to the spinal cord. A tassel of vesicles was seen emerging from the right sylvian fissure and other groups of more sharply defined vesicles were observed on either side of the pons. Two tassel-like groups of vesicles were present on either side of the pons and met over the quadrigeminal bodies. The fourth ventricle and the aqueduct of Sylvius were filled with a dry cheesy material. The diagnosis was infestation with cysticercus racemoseus.

The pathological changes were meningo-encephalitis and choroiditis caused by the cysticercus racemoseus.

mosus, ependymitis granulosa, cysticercus endartentis at the base of the brain and in the branches of the right middle cerebral artery distal to the lenticulostriate artery, and cortical infarction.

The loss of vision was caused clinically by primary atrophy of the right optic nerve and secondary atrophy of the left optic nerve, the result of mild hydrocephalus produced by the exudate in the aqueduct of Sylvius and in the fourth ventricle. Microscopically, both nerves showed chronic inflammatory and degenerative changes due apparently to the proximity of the cysticercus which extended from the right sylvian fissure into the anterior fossa.

EDWARD S. PLATT, M.D.

### SPINAL CORD AND ITS COVERINGS

Bellucci, B. Roentgenological Visualization of the Ependymal Canal in a Case of Hydromelia (Visualizzazione radiologica del canale dell'ependima in un caso di idromelia) *Radiol med*, 1934, 21: 1418.

The case reported was that of a man fifty years of age who entered the clinic complaining of pain which gradually localized in the lumbar region of the spinal cord. On lumbar puncture the cerebrospinal fluid escaped under high pressure. The fluid was turbid and contained many polymorphonuclear leukocytes, and large cells, probably ependymal elements.

As symptoms of partial paralysis of the lower extremities set in, a myelographic examination was made following the introduction of about 2 c.cm. of 20 per cent iodized oil into the subarachnoid space of the spinal cord according to the usual technique. The needle was introduced into the intervertebral space between the first and second lumbar vertebrae.

The roentgenogram presented a strongly radio-opaque line which was identified as the ependymal canal of the spinal cord.

This opaque line measured about 2 mm. in width, extended from the seventh thoracic vertebra to about the middle of the twelfth thoracic vertebra, and ended at the upper level of the second lumbar vertebra in a small, cup-like shadow (terminal ventricle of Krause).

The author states that this case is the first to be recorded in the literature in which it was possible to visualize the ependymal canal roentgenographically.

In describing the pathologico-anatomical picture he reviews the sequence of events which led to accidental introduction of the iodized oil into the central canal of the cord. In his opinion the picture was that of hydromelia due to medullary compression following the formation of an ossifluent abscess invading the spinal canal.

RICHARD E. SOMMA, M.D.

Fletcher, E. M., Woltman, H. W., and Adson, A. W. Sacrococcygeal Chordomata. A Clinical and Pathological Study. *Arch. Neurol. & Psychiat.*, 1935, 33: 283.

The authors review ten cases of sacrococcygeal chordoma which, in their general aspects, resembled

the seventy-five cases reported to date. They state that chordomata of the sacrococcygeal region have been found more frequently in males than in females. The problem of the relation of trauma to the development of such tumors is of interest. Two of the authors' patients giving a history of injury were women. One of these women had suffered a fall on the buttocks forty-six years previously and the other had had a similar injury twelve years previously. In some of the reported cases the symptoms of the tumor dated from the time of an injury.

Pain was present in all of the cases reviewed by the authors, and in all but one it was the initial symptom. Tenderness was a common complaint. Numbness was recorded as a symptom in seven cases and could be demonstrated in all of the six cases in which the patient was subjected to a neurological examination. Sphincteric disorders were present in eight cases.

In five cases the physicians who had treated the patients earlier had had their attention focused on the presence of hemorrhoids. This is not only interesting, but suggestive. Moreover, oedema of the legs in two cases, while not an early sign, and varicose veins of the legs in one case attest to rather frequent interference with the local circulation.

The most valuable examination in these cases was digital exploration of the pelvis through the rectum. In nine cases a tumor could be palpated. The authors call attention to the importance of examining the hollow of the sacrum. They state that too frequently the interest of the examiner leads him to limit palpation to the prostate gland and that when this is done even a large sacral tumor may easily escape recognition.

In four of the authors' cases roentgenograms showed evidence of destruction of the sacral vertebrae suggesting the presence of a malignant growth. In five, the roentgenographic report was negative. The authors believe that the incidence of negative findings would probably have been lower if recent improvements in the roentgenological technique had been known at the time the examinations were made. No picture diagnostic of chordoma as distinguished from other malignant tumors could be established. Studies with 40 per cent iodized poppy-seed oil in the cases of suspected sacrococcygeal chordoma may yield diagnostic information before routine roentgenograms become positive.

The duration of the illness in the reviewed cases ranged from eight months to eleven years. One patient was alive and in apparently good health nine years after the operation. In the case of one patient who is still living the operation was performed only a year ago. Eight of the patients are dead.

As in cephalic cases, a pre-operative diagnosis of chordoma apparently can be made only by biopsy. In one case the diagnosis was made in this way before the patient came to the Mayo Clinic. In only one case, seen in 1926, was the possibility of a notochord tumor entered on the records. This diagnosis was



## INTERNATIONAL ABSTRACT OF SURGERY

made by Plummer. The situation of the pain, which is usually lower than that associated with other caudal tumors such as ependymal gliomata, the tenderness, the high and early occurrence of perianal anesthesia, and the sphincteric disorders are notable worthy.

The observations made in a study of ten cases of sacrococcygeal chordoma showing wide histological variation have led to the conclusion that notochordal tumors, although they may resemble either epithelial or mesodermal neoplasms, have specific characteristics by which they may be distinguished. Briefly these are: (1) the formation of intracellular and extracellular mucus (2) the presence of physaliphorous or large vacuolated mucus-containing cells (3) a lobular arrangement of the tumor cells, which usually grow in cords (4) the occasional occurrence of vacuolation of the nuclei and (5) close resemblance to notochordal tissue as seen in the nuclei pulposi of the intervertebral disks.

In most cases of sacral chordoma complete removal of the tumor is impossible as it would require removal of the entire sacrum. However much can be accomplished to alleviate pain, retard the growth of the tumor and control the neurological symptoms by operative measures and radiotherapy.

In all but one of the cases reviewed the treatment was about the same, namely, as complete surgical removal as possible followed by roentgen therapy. In one instance only biopsy by roentgen therapy played with the hope of relieving pain and retarding the growth of the tumor.

When the tumor is extremely vascular irradiation undoubtedly retards invasion of the surrounding tissues, but when the tumor is cartilaginous irradiation is of little value.

Surgical resection of the tumor decompression of the sacrum, and high-voltage roentgen therapy relieves pain, retard the growth of the tumor and prolong life.

## PERIPHERAL NERVES

Sarroux. Isolated Tumors of the Peripheral Nerve.  
Les tumeurs isolées des nerfs périphériques. *Rev de chir* 1934, 53, 608.

The author reports four cases of isolated tumors of the peripheral nerves. He gives a historical review of the various theories regarding the pathogenesis of such tumors and their classification as peripheral gliomata, neuromata, neurofibromata, and peripheral fibrosarcomata.

A review of the literature showed that the clinical history of these tumors is more or less uniform. Trauma is considered a secondary etiological factor.

In 63 per cent of the cases reported in the literature a nerve of the arm was involved. The tumors grow slowly and usually develop in the region of an articulation or where a nerve pierces an intermuscular septum. They are attached only to the nerve and are movable. The chief subjective symptom is pain, especially on movement of the extremity. Motor weakness is unusual although fatigability of the extremity may be noted. The tumors are usually discovered by chance, and when first seen by the physician are usually the size of a walnut.

In the differential diagnosis it is necessary to rule out tumors of the skin and subcutaneous tissues, atheroma, neurinoma, myxoid cysts, chronic adenoma, and von Recklinghausen disease.

The four tumors reported by the author are classified as gliomata. They were all encapsulated. They presented a myxomatous structure and cystic degeneration. On microscopic examination they were found to be made up of two types of tissue: (1) a compact mass of fusiform cells with fine, regular fibrillary structure, and (2) loose reticular mass of branching stellate cells. The latter states that such tumors are formed from the sheath of Schwann and are of ectodermal origin. They do not contain nerve elements, and bear only slight relationship to certain comparable tumors of the central nervous system.

As treatment, Sarroux recommends (1) excision, when possible or (2) resection of the tumor and the nerve. The latter procedure should be reserved for the less important nerves. O. H. JONES, JR. M.D.

Grosset, H., Dacrocquet, R., Isaac-Georges, P. and Blard, M. Neurofibromatosis with Cutaneous osseous de la neurofibromatose. *Presse méd. Par* 1934, 4, 1060.

Bone lesions have not generally received sufficient attention as an essential part of the condition known as von Recklinghausen disease. A review of the literature shows that children with skeletal anomalies often have coffee-colored marks on the skin identical with those found in von Recklinghausen disease tumors.

Some individuals with von Recklinghausen disease present various anomalies of a congenital type such as dislocation of the hip and spina bifida. There is also a group showing bony dysplasias resembling osteomalacia. As the result of this condition deformities of the spine, face, head, or thorax may be present, spontaneous fractures may occur and decrease in the density of the bones is shown by roentgen examination.

MARSH W. POOLE, M.D.

## INTERNATIONAL ABSTRACT OF SURGERY

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## PERIPHERAL NERVES

Sarrotte. Isolated Tumors of the Peripheral Nerves  
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MARSH W. POOLE, M.D.

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Two morbid conditions may be associated in the same organ in one of two ways. They may meet accidentally or one may play a rôle in the causation of the other. The author's cases presented both possibilities.

As cancer is a debilitating disease it is occasionally complicated by an exacerbation of a pre-existing smoldering tuberculous process. It is noteworthy, however, that in a few of the reviewed cases in which active tuberculosis developed subsequent to carcinoma the infectious disease was confined to the lung involved by the tumor. It is possible that in these cases the release of the "immured" tubercle bacilli was due to immunological as well as mechanical factors.

The problem of whether pulmonary tuberculosis may be responsible for the initiation of a primary carcinoma of the lung has been a subject of discussion. Some investigators have agreed that in many cases there has been an etiological relationship between the two maladies, and the literature contains reports of cases of cancer originating in a tuberculous cavity or a tuberculous scar. However, careful study shows that cancer cells found in a tuberculous cavity had their origin in the bronchial wall and invaded the cavity secondarily.

The author emphasizes that the possibility of malignant disease should be considered in the cases of all persons of middle age or older who are suffering from a chronic pulmonary affection with persistent symptoms, particularly when there has been a progressive loss of weight and strength, and that the presence of pulmonary tuberculosis does not exclude the presence of a malignant process in the same lung.

JOSEPH K. NARAT, M.D.

Johns, E. P., and Sharpe, W. C. Primary Pulmonary Sarcoma. *Am J Cancer*, 1935, 23, 45.

The incidence of intrathoracic tumors shows an apparent increase which is much more rapid than can be explained by the general increase in the incidence of cancer and is probably due to better diagnostic methods and increased human longevity. It is evident, however, that the increase resulting from improvement in diagnosis is due to the more frequent recognition of pulmonary carcinoma. Primary sarcoma of the lungs still remains an obscure and comparatively rare condition.

The authors report a case of primary pulmonary sarcoma in a patient eighteen years of age who complained of a persistent cough, hæmoptysis, and slight loss of weight. Physical examination revealed impairment of resonance over the upper right chest and widening of mediastinal dullness in the first and second right interspaces anteriorly and in the inter-scapular region on the right side posteriorly. Over the first and second interspaces anteriorly the breath sounds were bronchovesicular in type. The heart seemed to be slightly enlarged to the left, and a systolic murmur was heard about half way between the pulmonic and mitral areas.

Repeated sputum tests were negative for acid-fast organisms. Stereoroentgenograms of the chest revealed a moderately dense, homogeneous circular, discrete deposit 2.5 in. in diameter occupying the inner half of the right first and second interspaces.

Death occurred fifteen months after the onset of the symptoms.

At autopsy, the right pleural cavity was found practically obliterated by firm fibrous adhesions and it was impossible to remove the right lung intact. On removal, the lung was discovered to be replaced almost entirely by a crumbly, grayish-white, hæmorrhagic tumor mass. Only a narrow rim of atelectatic lung tissue was seen about the margin of the new growth. The tumor was very friable and broke off readily into large, soft, translucent, grayish-white masses. Throughout, it showed extensive hæmorrhage. Its central portion appeared to be cystic and filled with blood clot and necrotic tissue. Medially, it could be traced into and along the right main bronchus to a point about 1.5 cm. above the bifurcation of the trachea. The right bronchus was entirely occluded, and the growth encroached on the opening of the left main bronchus. The tumor was not attached to the bronchial mucosa, it appeared to be growing along the lumen of the bronchus. It occupied also the lumen of the right pulmonary vein and extended along this structure into the left auricle. The left auricle was practically filled by a firm, brownish-red, oval mass of tumor measuring about 4 by 2 cm. The tumor lay free in the auricle, but appeared to have invaded the intimal lining of the vein. There was definite obstruction of the auriculoventricular valve. The left lung presented a number of small, firm, discrete nodules, the largest of which was about 4 mm. in diameter. The liver appeared normal externally, but on section presented several small nodules, the largest of which was about 5 mm. in diameter.

On microscopic examination the tumor was found to be extremely cellular and composed of round and spindle cells.

Exclusive of pulmonary lymphosarcoma, which is not regarded as primary in the lung, pulmonary sarcomata are usually classified on a morphological basis into two groups—spindle-cell sarcomata and round cell sarcomata. The spindle-cell sarcoma, the more common type, occurs as a circumscribed tumor in elderly persons. It usually grows slowly, and

## INTERNATIONAL ABSTRACT OF SURGERY

be developed in cases which were definitely inoperable. Its object is irradiation of the breast, the axilla, the supraclavicular region, and the medi-

series is too small to warrant definite conclusions  
J. DANIEL WILLIAMS, M.D.

## TRACHEA, LUNGS, AND PLEURA

Overholt, R. H., and Fisher, L. S., 2nd. Changes in Venous Pressure After Thoracoplasty; Its Significance in Relation to the Extent of Rib Removal. *J. Thoracic Surg.* 9:5, 41, 809.

Estimations of venous pressure were made before and after operation in a series of cases in which thoracoplasty was done. The significant alterations of venous pressure found occurred on only one side or predominantly on one side. It is important to distinguish between unilateral elevation of the venous pressure which is of mechanical origin and general elevation of the venous pressure which is of cardiac origin. As none of the cases showing evidence of cardiac insufficiency it was assumed that the venous disturbance was due to local mechanical conditions resulting from the disease or brought about by the collapse procedure.

In the cases with unilateral elevation of the venous pressure before the operation the elevated pressure was corrected by the thoracoplasty. When the first stage of the operation is limited to the upper three or four ribs there is little likelihood of disturbing a normal pre-operative venous pressure. The elevation of more than four ribs (completely or in long segments) frequently disturbs the venous return on the side operated upon.

When the second stage of thoracoplasty is performed within two weeks after the first, an elevated venous pressure on the side operated upon may be expected.

The authors were impressed with the relationship between postoperative elevated venous pressure and what was considered poor tolerance to the amount of collapse. An elevated venous pressure has seemed to indicate an excessive degree of collapse.

Knowledge of the condition of the venous circulation obtained by measurement of the venous pressure has seemed to be of value as it has aided in the estimation of the extent of rib removal which will insure a wide margin of safety during convalescence and that the second operation should not be done so soon after the first that the effect of both equals the effect of a too-extensive single operation.

JACOB M. MORA, M.D.

Fried, R. M. Bronchiogenic Cancer Combined with Tuberculous of the Lung. *Am. J. Cancer* 9:5, 3, 417.

Fried reports thirteen cases in which both tuberculous and cancer are present in the same lung. The patients are men ranging in age from forty-five to seventy-one years. In ten cases the tumor was on the left side and in three on the right side. The upper lobe was involved in eleven cases and the lower lobe in two. The neoplasms included five

Into the breast Hatchcock inserts needles in three planes parallel with each other and superimposed to form a cone with its point at the nipple. The lower plane consists of needles inserted from the periphery of the breast, undercutting the breast itself at its base. These needles are parallel with each other—not arranged in the form of the spokes of a wheel. Their points therefore approach each other above and below but not in the central portion underlying the nipple. The second plane consists of another group of needles inserted in the same manner but located halfway between the basal plane and the point of the breast, the nipple. Of necessity the points of these needles approach each other more closely than those of the needles in the deepest plane. The last and most superficial plane consists of a single radium needle inserted just beneath the areola at right angles to all the other needles. This final needle covers the region at the apex of the cone not already adequately covered by the deeper layers of the needles. The effect achieved is that of a cone irradiated but not containing needles.

In the axilla the author inserts needles from below upward in the anterior and posterior axillary folds, in the chest wall, and in the lateral axillary wall, close relationship to the great vessels where the latter enter the upper arm. The general effect is that of a cylinder of needles in the four walls of the axilla. The apex of the axilla is covered by inserting two or three needles parallel with and just below the clavicle, pointing laterally two or more needles from above downward, above and behind the clavicle into the apex of the axilla, and three needles from below backward tangential to the ribs just below the blood vessels.

The supraclavicular area is irradiated by inserting three needles into the sternocleidomastoid muscle from its medial border laterally and then introducing three needles across the posterior triangle of the neck so that they almost but not quite meet the first three needles. In addition, a needle is inserted vertically across the base of each of these two groups of needles (in the relation of the back of comb to its teeth).

The mediastinum is irradiated by introducing three gold seeds into the anterior mediastinum through each of the upper four intercostal spaces. The insertion is made obliquely, the edge of the sternum and under the edge of each of the adjacent ribs, one seed being deposited at each of the adjacent spaces.

After all of the needles have been introduced stereoscopic roentgenograms are made to verify their distribution. The needles are left in position for seven days. The arm is placed in position for at right angles to the body.

Fifty-three of the thoracic patients have been treated in this manner with gratifying results, but the

cancers of the small round-cell variety, six squamous epithelial cancers, one keratinizing epidermoid carcinoma, and one adenocarcinoma. The tuberculous lesion was of the healing fibrotic type and apparently of long standing. Most of the patients had had a cough for a number of years. In two cases there had probably been a recent dissemination of the bacillary infection causing a slight exacerbation in which the advancing cancer may have played both a biological rôle by lowering the patient's resistance and a mechanical rôle. In some of the cases the malignant condition developed independently of the tuberculous disease, while in others it was engrafted on the old fibrotic infection.

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## INTERNATIONAL ABSTRACT OF SURGERY

without the formation of metastases. The round-cell sarcoma, a very cellular tumor composed of large or small round cells, occurs in young persons and progresses rapidly. It is apt to be accompanied by hemorrhage and necrosis, but shows little tendency to metastasize.

The tumor described by the authors presented points of resemblance to both types. Histologically the two types of cells are quite similar and undoubtedly have their origin in a common progenitor. The variation in the cells is due to stages in the differentiation of the original cell type, the spindle cell being the more mature form. This interpretation suggests that the morphological classification represents only a superficial difference in the various sarcomata of the lung, and that primary pulmonary sarcoma composed of round cells and those composed of spindle cells arise from a common cell type, the variation in cells being due to stages in the differentiation of the primitive mesenchymal cell.

By some, the septal cells are believed to belong to the reticulo-endothelial system. This conception of the mesodermal origin of the septal cells makes it easier to understand the development of sarcoma from the pulmonary alveoli and suggests a possible source for the tumor in the case reported.

JOSEPH K. NAKAT, M D

## HEART AND PERICARDIUM

Bernabeo, E. The Experimental Pathological Anatomy of Pericarditis (Abdomen pathologica sperimentale delle pericarditi) *Arch Ital di chir* 834 J 233

Following a review of the characteristics of the twelve types of pericarditis which have been distinguished on pathologic-anatomical or etiopathogenic basis, the author reports experiments which he carried out on dogs to study the successive stages of the development of the condition and the effect of the pericarditis on the myocardium. The pericarditis was produced in the experimental animal by injecting Dakin's solution into the pericardium, and its development was followed by roentgen examination. From thirty to one hundred and fifty days after the injection the animals were killed and the pericardium and myocardium were used macroscopically and microscopically.

In discussing the results of these experiments Bernabeo calls attention to the difficulty of comparing the ritually produced aseptic inflammatory lesions with those occurring in clinical cases as the result of infection. The severity of the changes in the pericardium and myocardium are found to be roughly proportional to the concentration of the solution injected, and the myocardial damage varied in degree with the pericardial injury. From his findings the author concludes that in the surgery of the pericardium clinical estimate of the condition of the myocardium is of the greatest importance.

ELIAS T. LIGERT, M D

## ESOPHAGUS AND MEDIASTINUM

Perslow, O. Swallowed Foreign Bodies (Ueber verschluckte Fremdkörper). *Acta chirurg. Scand* 935, 76 63

The author reviews 5 cases of swallowed foreign bodies which were treated in 7 large Swedish Hospitals during the period from 91 to 1919. In all, the clinical diagnosis, as proved by spontaneous evacuation, operation, or roentgen examination. The unreliability of the history is emphasized. The cases are classified according to the nature of the object swallowed. The author states that the majority of swallowed objects are evacuated spontaneously without causing the slightest trouble or discomfort. Such is the case when the object is round. Spontaneous evacuation may be expected also in the case of objects which are pointed at one end only such as screws. On the other hand, experience shows that objects which are pointed at both ends (such as needles) readily become fixed and give rise to severe complications. Perslow therefore believes that patients who have swallowed an object which is pointed at both ends should be kept under very careful observation in a hospital, whereas those who have kept under observation as out-patients. He regards roentgen examination as essential to determine the nature of the swallowed object. He emphasizes that reliance should never be placed on the history alone.

In a considerable number of the cases reviewed operation (usually gastrostomy) was done to remove the foreign body, but the author believes that in most of them it was not indicated as they were no symptoms or signs of ill-effects. Operation was necessary to save life in only a few cases. The reason for most of the early operations seems to have been the fear that spontaneous evacuation would not occur.

The author reports 3 cases in which the foreign body became lodged in the esophagus and its extrication by esophagography as out of the question. By means of a soft stomach tube the foreign body was pushed down into the stomach for evacuation by way of the intestines.

Finally Perslow reports in detail four cases of foreign bodies lodged in the lower portion of the esophagus in which repeated attempts at extraction by esophagography were unsuccessful. In all of these cases the foreign body was removed by laparotomy. The stomach was opened sufficiently to allow the whole hand to be introduced and the foreign body brought out through the crura by means of long pair of forceps.

In the author's opinion most cases of swallowed foreign body should be treated expectantly by the administration of bulky foods and restriction of food. If possible the passage of the foreign body should be followed by roentgen examination. If the patient should be put to bed on his right side. If it remains in the cerum is an oral passage is best furthered by raising the foot of the bed.

The author warns against giving laxatives. In his opinion operation is not indicated unless intestinal symptoms or symptoms of peritonitis appear or until repeated roentgen examinations have shown the foreign body to be impacted. A roentgen examination should be made immediately before the operation.

**Austoni, A.** Cicatricial Stenosis of the Oesophagus, Indications for and Late Results of Its Treatment (Stenosi cicatriziali dell'esofago, nuovo contributo all'indirizzo di cura e sugli esiti a distanza) *Chir. chir.*, 1934, 10: 1206

Austoni, Chief Surgeon of the Municipal Hospital of Verona, reports in detail a case of cicatricial stenosis of the oesophagus of long standing in which, after other methods of treatment had failed, retrograde dilatation with a sound produced a clinical cure. He discusses also six cases in which a good result was obtained by the same procedure from ten to twenty years ago. He emphasizes that in even very severe cases, retrograde dilatation may result in a permanent cure if it is carried out far enough (to at least the passage of a No. 34 dilator) and is continued until there is no further tendency of the stenosis to contract. As many cicatricial stenoses have a tendency to become recanalized spontaneously to a degree sufficient for the passage of a thread attached to a dilator, the surgeon should not be too hasty in concluding that a given stenosis cannot be dilated. Austoni has found retrograde dilatation safer and generally more satisfactory than other methods of treatment. He shows its results in two cases by roentgenograms. He is of the opinion that in all cases of lye burns of the oesophagus early retrograde intubation of the oesophagus is advisable to prevent cicatricial stenosis or to facilitate treatment of that condition in the initial stages.

EUCENE T. LEDDY, M.D.

**Incze, J.** A Case of Primary Tuberculosis of the Oesophagus (Ein Fall von primärer Speiseröhrentuberkulose) *Arch. f. path. Anat.*, 1934, 293: 540

Tuberculous disease of the oesophagus is extremely rare. It is usually the result of implantation of the infection following an erosion, encroachment from the surroundings, or hematogenic or lymphogenic infection. Primary tuberculosis of the oesophagus has never been reported heretofore.

The case of primary tuberculosis of the oesophagus reported by the author was that of an idiot boy ten years of age who, twenty months before his death, swallowed caustic soda and developed a stricture of the oesophagus. For a time he was nourished through a gastric fistula. After dilatation of the stricture the fistula was closed. Death resulted from miliary tuberculosis.

Autopsy revealed, in addition to miliary tuberculosis, two constrictions of the oesophagus, one posterior to the cricoid cartilage and the other at the level of the bifurcation. Between the two strictures the lumen was somewhat dilated and the

mucosa entirely denuded of epithelium. The entire thickness of the wall of the oesophagus was infiltrated with tuberculous nodes varying in size from that of a millet seed to that of a pea. Some of the nodes were caseous. In the connective tissue around the oesophagus in this region were large lymph nodes, some of which were entirely caseous. In the other organs only miliary tubercles were found. It was apparent, therefore, that the tuberculosis developed first in the oesophagus in the region of an epithelial defect produced by the action of the caustic soda and that the miliary tuberculosis was secondary. (SALZER) LOUIS NEUWELT, M.D.

## MISCELLANEOUS

**Dunhill, Sir T.** Diaphragmatic Hernia. *Br. J. Surg.*, 1935, 22: 475

Dunhill reviews twenty-five cases of diaphragmatic hernia. In eleven, the oesophagus was of normal length and a part or all of one or more abdominal organs was herniated into the thoracic cavity. In the fourteen others the oesophagus was congenitally short and a portion of the stomach was in the thorax. Of the eleven patients with an oesophagus of normal length, eight were carefully investigated clinically and roentgenologically and finally operated upon. The fourteen patients with a short oesophagus were studied less completely as most of them were not treated surgically.

The cases were classified according to the site at which the abdominal organ or organs entered the thorax. As none of the herniae had followed a known injury, they were all assumed to be of congenital origin. The sites of the hernial orifices were as follows: retrosternal region, one case, left dome, two cases, costovertebral region, three cases, and oesophageal region, nineteen cases. The cases in which the hernial orifice was in the oesophageal region included three of hernia diaphragmatica transversa, two of para-oesophageal hernia, and fourteen of short oesophagus.

In the case of hernia through the retrosternal attachment of the diaphragm a barium meal or an enema showed the termination of the ileum, the caecum, the appendix, the ascending colon and the transverse colon in the thorax. There was no splenic flexure, on leaving the thorax the colon descended directly to the left iliac fossa. The oesophagus entered the abdomen in the normal position, posterior to the pericardium, while the herniated viscera entered the thorax anteriorly immediately behind the lower end of the sternum. The sac and its contents occupied the anterior mediastinum, resting against the pericardium and pleura on the left and displacing the right pleura and lung backward and to the right.

In the cases of hernia through the left dome of the diaphragm the herniation was actually through the substance of the diaphragm—not through any of the natural openings. Roentgenograms showed the cardia and the pyloric portion of the stomach in the

abdomen, but a large portion of the middle of the stomach in the left thorax, displacing the mediastinum, pericardium, and heart to the right. At operation no peritoneal sac was found. Dense adhesions bound the stomach to the margins of the orifice and to the compressed lung. The stomach was rotated on its axis, and the spleen was above the diaphragm. The stomach was greatly dilated and could be replaced in the abdomen. Gastrostomy was done to give temporary exit to its gaseous contents and relieve the patient of postoperative discomfort.

Röntgenological examination of the hernia showed the costovertebral angle showed, (1) perforation of the stomach and transverse colon in the thorax (2) the whole stomach, including both orifices, in the thorax and (3) the stomach angulated over the edge of the diaphragm. The author states in each of these three cases the hernia was due to congenital absence of the left crus and the muscular fibers continuous with it. In one of the cases both crura were absent, the diaphragm having no posterior attachment in the region of the vertebral column.

Hernia in the region of the oesophagus are of the following three entirely different anatomical types to non-development of the diaphragmatic crura. It is not a para-oesophageal hernia occurring through the hiatus. There is a gap between well-defined muscle fibers of the posterior margin of the diaphragm which bounds the sac anteriorly and the vertebral column and the adjoining parts of the paravertebral grooves which bound it posteriorly. Through this gap the peritoneal sac ascends into the posterior mediastinum. The defect is therefore behind the incomplete diaphragm.

Para-oesophageal hernia. In this condition the hiatus is present but dilated. The hernial sac passes up through the hiatus lying beside the oesophagus. 3. Hernia associated with congenitally short oesophagus. In this condition the cardia and a portion of the stomach are situated within the thorax. The herniated portion of the stomach is surrounded by peritoneal sac, so that true hernia exists. The stomach is the shape of an hourglass, the cardiac lobe being a thin thorax and the pyloric lobe within the abdomen.

In diaphragmatic hernia the symptoms simulate those due to gall stones. J. DANNI WILKINS, M.D.

Forty Y. Congenital Hernia Through the Right Side of the Diaphragm. *Am J Surg* 935, 42

The author reports a case of acute intestinal obstruction in a man seventy years old which was caused by a hernia in the right dome of the diaphragm, the rare site of diaphragmatic hernia. The patient complained of constipation of six days' duration. Before the development of this condition, bowel action had always been regular. The

constipation was accompanied by general abdominal pain, frequent vomiting, and hiccoughing. Many years previously the patient had been kicked in the chest when he fell from a horse. On examination, he seemed in good general health. The abdomen was apparently distended and generally tender and costal tenderness and rigidity. The first fluid as found to be blood-stained and the entire small intestine distended and congested. On investigation, a circular opening was felt in the right dome of the diaphragm. Through this opening approximately the last 5 ft. of the small intestine had passed into the right pleural cavity, this accounting for the development of the intestinal obstruction. The appendix had pushed up through the opening along with the intestine. The caecum lay immediately below the diaphragm.

The patient died a few hours after the operation, apparently of paralytic ileus. On postmortem examination an almost circular opening,  $\frac{3}{4}$  in in diameter was found in the right dome of the diaphragm immediately to the right of the pericardium. Posteriorly this opening was bounded by the right leaf of the central tendon. Anteriorly and laterally the costal muscle fibers of the diaphragm ended in its margin. The pleural and peritoneal cavities communicated freely through the opening. A hernial sac as present. The pleural and peritoneal serous membranes were continuous over the margin of the opening which was perfectly smooth and free from adhesions.

J. DANNI WILKINS, M.D.

Troisdele, P. E. Diaphragmatic Hernia at the Thoracic Stomach. *Brit J Surg* 935, 440

The author reports the fourth of a series of six cases of diaphragmatic hernia at the oesophageal hiatus in adults. He calls attention to the similarity of the symptoms to those of angina pectoris. In pairing these hernia he has found the transbronchial approach best because (1) it is easier to cut down on a hernia than to pull it from within, (2) adhesions which usually form between the hernial sac and the thoracic viscera are visible, and (3) the hernial sac can be removed or pilated.

From study of the reported cases of congenital short oesophagus and thoracic stomach and of the embryology of the oesophagus, diaphragm, and stomach, he concludes that the length of the oesophagus is dependent upon the traction of the stomach downward. In the normal position the stomach is pulled down by the liver, transverse colon, and omentum. This traction is transmitted to the oesophagus and lengthens it. When it is absent the oesophagus remains short. Very frequently there is a congenital enlargement of the oesophageal hiatus. On the basis of these facts and the findings of his anatomical dissections and operations, Troisdele advances a new theory regarding the origin of congenital short oesophagus and thoracic stomach. According to this theory the thoracic stomach



is the result of herniation through a congenital enlargement of the œsophageal hiatus and may occur at any time after birth. If the hiatus closes before the stomach returns to the abdomen the stomach remains in the chest and establishes itself behind the pericardium. This causes a slight slack in the œsophagus which is taken up by future growth. However, continuous traction on the œsophagus is lacking and the œsophagus remains short.

SAMUEL PERLOW, M D

Rigler, L. G., and Eneboe, J. B. The Incidence of Hiatus Hernia in Pregnant Women and Its Significance. *J Thoracic Surg*, 1935, 4, 262

A roentgen examination of the stomach was made in the cases of 195 women in the third trimester of pregnancy. A small hernia through the œsophageal hiatus was found in 12, 1 per cent of the entire number and 18, 1 per cent of the multiparæ. In 7 cases the hernia was not demonstrable after parturition. There was no definite correlation of symptoms with the hernia. Increased intra-abdominal pressure such as is produced by pregnancy, especially when repeated, appears to be an exciting cause for the formation of œsophageal hiatus herniæ, even in young women.

JACOB M. MORA, M D

Andrus, W. DeW. Report of the Chest-Tumor Registry. *J Thoracic Surg*, 1935, 4, 236

At the present time the Chest-Tumor Registry contains records of 155 cases of chest tumors. These cover a wide variety of neoplasms and have been submitted from 28 clinics. In addition, roentgenograms made in 22 cases, photographs made in 16 cases, microscopic sections of 36 neoplasms, and tissue from 3 tumors are included in the files. This report deals with the 117 cases in which the diagnosis was definitely confirmed by biopsy, autopsy, or operative removal of the tumor. The remaining 38 cases were those in which the diagnosis was unproved and a few cases of metastatic tumors.

The types of tumor and the number of each type are as follows: primary carcinoma of the lung, 64; sarcoma of the chest wall, 16; lipoma of the mediastinum, 3; intrathoracic ganglioneuroma, 2; osteoma of the ribs, 2; echinococcus cyst of the lung, 1; sarcoma of the pleura, 1; sarcoma of the mediastinum, 7; mediastinal Hodgkin's disease, 2; myxoma of the mediastinum, 1; carcinoma of the mediastinum, 1; cysts of the lung, 2; pleural endothelioma, 4; sarcoma of the lung, 4; and dermoid cyst of the mediastinum, 7. A brief review of the various lesions is presented.

JACOB M. MORA, M D

# SURGERY OF THE ABDOMEN

## GASTRO-INTESTINAL TRACT

Norlander, K. Complications of Foreign Bodies in the Stomach (Zur Kenntnis der Komplikationen bei Fremdkörpern im Magen) *Die Chirurgie* 1935, 76, 36.

The author reports a case with a septic clinical picture caused by a swallowed fish bone. After slow perforation of the stomach wall and healing of the abscess, the fish bone remained stationary in a chronic abscess surrounded by perigastric fibrous tissue. Secondary infection then developed in the liver where, through acute changes up to the process, progressive multiple abscesses were formed. One of the abscesses broke through the diaphragm and gave rise to a fibrous encapsulated empyema of the right pleura.

This was a case of the rare perforation of a foreign body by the formation of a granulation tumor.

Wright, G. Collective Inquiry by the Fellows of the Association of Surgeons into Gastric Ulcer Ulceration. *Ann. J. Surg.* 1935, 433.

The author states that the findings of this collective inquiry regarding the incidence of gastric ulcer ulceration is extremely valuable despite the fact that only 5,603 patients operated upon for peptic ulcer only 3,603 could be traced.

Posterior gastrojejunostomy was performed on 734 patients. Of the 73, 30 were traced, the presence of gastrojejunal ulceration was proved by operation in 70 (44 per cent) and diagnosed on the basis of symptoms in 77 (45 per cent). Gastric ulceration as therefore demonstrated or suspected in a total of 549 per cent.

Of 683 patients with gastric ulcer, 307 were treated by posterior gastrojejunostomy, 507 were traced as proved by operation in 7 (51 per cent) and diagnosed on the basis of symptoms in 30 (53 per cent). Gastric ulceration was therefore demonstrated or proved in a total of 645 per cent. Of 83 traced patients who were treated by anterior gastrojejunostomy for duodenal ulcer, 39 were traced by operation in 4 (10 per cent) and diagnosed on the basis of symptoms in 6 (17 per cent). Their total incidence as therefore 35 per cent.

Of 5 traced patients who were treated for duodenal ulcer by anterior gastrojejunostomy with anastomosis, gastrojejunal ulcers or demonstrated by operation in 4 per cent and diagnosed on the basis of symptoms in 4 per cent. The total incidence of these ulcers in these patients as therefore 8 per cent.

Eight traced patients who were subjected to an anterior partial gastrectomy

for duodenal ulcer experienced no complicating gastrojejunal lesions, but 13 others were traced. Of 204 patients treated similarly for gastric ulcer, 199 were traced. Of the latter, gastric ulceration was proved in 12 (5 per cent) and diagnosed on the basis of symptoms in 17 (8 per cent). Of 77 patients subjected to a posterior Polya operation for duodenal ulcer, 70 were traced. Of these, gastric ulceration was made in the cases of 38 (54 per cent).

Of 38 traced patients who were subjected to Billroth I operation for duodenal ulcer, 30 were traced. Of these, gastric ulceration was made in the cases of 8 (26 per cent). Of 83 patients subjected to Billroth I operation for gastric ulcer, 77 were traced. Of these, gastric ulceration was demonstrated definitely in 35 (45 per cent) or diagnosed on the basis of symptoms in 17 (22 per cent). The total incidence of such ulcers in these patients was therefore 83 per cent.

It is of interest that of the 436 patients traced of the total of 844, 30 were treated for gastric carcinoma, none developed secondary ulceration.

The author concludes that secondary ulcer occurs in about 5 per cent of patients subjected to posterior gastrojejunostomy for duodenal ulcer.

In the cases reviewed, anastomotic ulcers occurred 85 times and jejunal ulcers 99 times.

In the treatment of secondary ulcers local operations are frequently unsatisfactory. The results of undoing the gastro-enterostomy and restoring normal gastro-intestinal continuity were disappointing. While a cure was obtained in 20 per cent of cases, 60 per cent required further surgery. In the cases reviewed, anastomotic ulcers occurred 85 times and jejunal ulcers 99 times. The establishment of a new gastro-enterostomy was also unsatisfactory, yielding good results in only 20 per cent of cases. Gastrorectomy resulted in cure in about 60 per cent but the posterior Polya resection a mortality of 30 per cent and the anterior Polya resection a mortality of 53 per cent. The results of the latter type of resection were less satisfactory than those of the posterior type.

When the general results of operation treatment of secondary ulceration were summarized they are also found disappointing. While at the first surgical attempt a reasonably good result was obtained in 5 per cent of the cases, 6 per cent of the patients required further operation, almost as many died as the result of ulceration, and patients died later as required further operation or operations up to the present time, 36 were restored to good or fair health. Of the 76 patients who were traced, 36 were restored to good or fair health, 8 died, and 32 could not be traced. When the results in the cases requiring more than one surgical intervention are combined, it is found that reasonably good results are obtained in

39 per cent but symptoms were still present in 9 per cent. Including operative deaths and deaths from secondary ulcers without surgery, the total number of deaths was 104. This means that 22.7 per cent of the patients suffering from secondary ulceration are known to have died. The complication of secondary ulceration is therefore disastrous.

SAMUEL J. FOGELSON, M.D.

Grilli, A. A Contribution to the Clinical and Roentgenological Study of Postoperative Peptic Ulcer (Contributo allo studio clinico-radiologico dell'ulcera peptica post-operatoria). *Radiol med*, 1934, 21: 1361.

The reported incidence of postoperative peptic ulcer varies from 1.4 per cent (Balfour) to 33 per cent (Berg).

The lesion occurs far more frequently in males than in females and is most common between the thirtieth and fortieth years of age. It may occur immediately or many years after gastro-enterostomy, but the average period of time between the operation and its development is from two to four years.

It usually occurs at the stoma of the anastomosis. It may be single or multiple. It has occurred after every type of gastro-enterostomy. Anatomically, the pathological changes are similar to those of gastric or duodenal ulcer. They may be limited to the mucosa, involve all of the coats, or perforate. Their pathogenesis has not been determined definitely, but their occurrence is undoubtedly favored by mechanical and traumatic factors such as irritation of the stoma by poorly digested food during gastric contractions, the presence of silk sutures, trauma from stretching and pulling on the stoma by gastric and intestinal motility, nervous factors, modification of the blood supply to the stoma, a constitutional predisposition, foci of infection, and hyperacidity.

Like the original lesion, the postoperative ulcer is manifested by pain occurring after eating and relieved by the ingestion of food. The pain usually occurs in the left side of the abdomen and may or may not radiate posteriorly or downward. Hemorrhage is a frequent complication.

The diagnosis is based upon the findings of careful roentgenological study. No one technique is applicable to all cases. Proper preparation of the patient is important. The stomach must be empty in order that the mucosal folds may be visualized. The stoma is localized by following the convergence of the folds. The examination should be begun with a small aperture under the fluoroscope. With adequate compression the niche as well as the form and size of the anastomosis and motor function may be shown. The best results are obtained with the patient erect because this position usually eliminates false niches due to mucosal folds.

The author reports the roentgen findings in seventeen cases of postoperative duodenal lesions. Two of the lesions were originally gastric. Eleven were ultimately confirmed by surgery.

SAMUEL J. FOGELSON, M.D.

Emery, E. S., Jr., and Monroe, R. T. Peptic Ulcer. Nature and Treatment Based on a Study of 1,435 Cases. *Arch Int Med*, 1935, 55: 271.

This report, which is based on nearly 1,500 cases of peptic ulcer, is largely an evaluation of the results obtained after medical and surgical therapy. The conclusions drawn will afford valuable guidance to both the internist and the surgeon in the treatment of gastroduodenal ulcerative disease. Evidence presented shows that ulcer is a chronic disease, our present methods of treatment are merely palliative, and cure is probably rare. The aim of treatment should be not only cure of the ulcer but also prevention of the appearance of other ulcers which are called "relapses."

The most important etiological factors in recurrence seem to be fatigue, emotions, and infection. While peptic ulcer rarely causes death or shortens life, it may be responsible for loss of time from work, it limits the range of the patient's activity, and it necessitates a change in his mode of living and regulation of his diet.

Of the patients whose cases are reviewed, approximately 81 per cent were definitely benefited by treatment, but of this 81 per cent only 32 per cent could be classified as cured. A table which compares the results of medical treatment with those of surgical treatment in 1,258 cases shows that surgical treatment was followed by continuous relief in a higher percentage of cases, but surgical failures were more than double medical failures and operation yielded a distinctly lower proportion of satisfactory results than medical treatment. It shows also that surgical intervention is just as unable to alter the course of peptic ulcer as medical treatment. The explanation for the unsatisfactory results of surgery and the fact that all medical measures gave better results than surgical procedures seems to be that patients who were operated upon were not afforded, or refused to accept, as much attention to their general health and after-care as those treated medically. None of the operative procedures yielded a high degree of satisfactory results. Simple posterior gastro-enterostomy, the most common operation, was almost as effective as posterior gastro-enterostomy supplemented by excision of the ulcer. Pyloroplasty was equally effective. Distinctly less favorable results followed operations in which division (transection) of the pylorus or removal of the pylorus or some portion of the stomach was done in addition. In condemning radical surgery the authors say, "Removal of the antrum was proposed with the idea that the loss of its hormone would decrease the production of hydrochloric acid. Experience has shown this to be a mistake. Since the operation removes the part of the stomach which has an alkaline secretion, it should be abandoned."

To obtain successful results from surgical therapy the operation must be chosen to meet the requirements of the particular case. It is advisable to inform the patient of the nature of his disease. He should be told that although an ulcer does not seriously

threaten life and does not tend to progress in severity. It may interfere with his comfort and activity from time to time, and that while there is no known means of obtaining a permanent cure there are various conservative measures which can make him comfortable and able to work efficiently. Most patients are already definitely convinced of the chronicity of their trouble before the physician sees them. When their fears have been confirmed and allayed they are transformed from a restless, dissatisfied group wandering from doctor to doctor to one which realizes the need for daily care, attention to hygiene, and occasional medical investigation.

Cases of gastric ulcer are treated in much the same way as those of duodenal ulcer although they are more closely supervised. Such ulcers are, or become, malignant in only 5 per cent of the cases. If the case of gastric ulcer under strict hospital medical management does not show healing roentgenologically after three weeks, immediate surgery is advisable. A roentgen study should be made three and six months later and thereafter at least once a year.

Hemorrhage is also treated conservatively. In 95 per cent of the reviewed cases the bleeding stopped spontaneously. It is the task of the physician to prevent its recurrence. At present there is no way of saving the 5 per cent of patients who continue to bleed until death supervenes for it is only in this relatively small group that surgical intervention is justified and unfortunately there is no way of determining which patients are going to belong to this group. The theory is prevalent that patients with ulcer are less likely to bleed after surgery than after medical therapy. Accordingly there is a tendency to advocate surgical intervention whenever a patient has had severe bleeding. The statistics presented do not lend any support to such a theory. Of 50 patients treated medically 59.5 per cent bled after the medical treatment during an average observation period of three and six-tenths years. Of 55 patients treated surgically 7.4 per cent had another hemorrhage within an average period of four and eight-tenths years. Even if correction is made for the difference in the time of observation and allowance is made for a greater tendency to bleed in the surgical cases, it is still clear that surgical intervention does not prevent future hemorrhages any more than does medical treatment.

Operation should be done only for definite purposes, namely to close perforation, to relieve permanent obstruction of more than 40 per cent disclosed by the fluoroscope six hours after a barium meal and to overcome hemorrhagic tendency. It is indicated also when there is reasonable suspicion of carcinoma or malignant degeneration. The operation of choice is that which accomplishes the specific purpose in view and causes minimal interference with the physiological action of the stomach. Subsequently the patient should be treated in the same way as patients with ulcer who have not been operated upon. During the periods of hypersecretion the patient should be treated with particular care med-

ically operation performed at such time is disastrous.

SAMUEL J. FORDHAM, M.D.

Ogden, W. H. The Place of Surgery in the Treatment of Peptic Ulcer. *Lancet* 1934, 284, 419.

Although the operations devised for peptic ulcer are numerous, they all belong to one of the following three groups: (1) local excision of the ulcer site varying amounts of healthy tissue and preservation of gastro-intestinal continuity; (2) short circuiting operations and (3) gastrectomies.

The value of local excision of the ulcer is doubtful. The ulcer which has been removed is replaced by scar which is smoother than that of a healed ulcer but longer. Nothing is done by local excision to counteract the cause of ulceration, and the deformity at the site of the excision adds the factor of mechanical trauma.

The chief short-circuiting operations are gastroduodenostomy and gastrojejunostomy. In both of these operations the attempt is made to overcome stasis and counteract acidity by making an anastomosis between the stomach and small intestine. These procedures do not diminish the secretion of acid, but they insure neutralization of the acid by allowing the free entry of alkaline juices into the stomach. Posterior gastroenterostomy is best because it is safe and mechanically satisfactory. The resulting stoma is large and free from tension and adhesions to neighboring structures. It moves with the contractions of its component parts and the neighboring organs. The operation can be performed.

The first case by the experienced surgeon and is capable of giving brilliant results.

The claim has been made that the various gastroduodenal anastomoses are more physiological than gastrojejunostomy because (1) the new opening is at or near the pylorus, and (2) the gastric chyme passes into a part of the intestine which is accustomed to an acid medium. However those advancing the first argument ignore the fact that the pylorus is a sphincter acting under reflex control, and so artificial opening, wherever placed, can assume its function. The second argument is unsupported because the rapidly with which food passes through the duodenum and the first few coils of the jejunum makes it extremely improbable that the reaction can differ in the various juxtapyloric operations are technically much inferior to gastrojejunostomy. Hemorrhage and soiling mar their performance. The stoma is clumsy, fixed, and under tension because of local difficulties and postoperative leakage is not unknown. As might be expected, the late results are, on the average, inferior to those of the older and simpler form of anastomosis.

Gastrectomy serves the following four purposes in the treatment of ulcer:

1. It removes the ulcer itself when the lesion is in the stomach or the first part of the duodenum.

2. It overcomes any stasis that may be present.

3. It allows for neutralization of the gastric secretions by the intestinal juices.

4 It reduces acid production in proportion to the amount of acid-secreting surface removed

In a series of postmortem operations at Leeds on the bodies of patients who had undergone gastrojejunostomy for duodenal ulcer from nine months to nineteen years before death, gastrojejunal ulcers were found in 22 out of 30. Their incidence was therefore 73 per cent. Of the last eighty-two of the author's cases of duodenal ulcer, gastrojejunal or gastrojejunocolic ulcers occurred in seventeen (21 per cent). A patient with a gastrojejunostomy may be comfortable, but he is never safe. Oglvie believes that ulceration at or near the stoma will eventually follow gastrojejunostomy performed for duodenal ulcer in at least 20 per cent of cases. Eventually another, always difficult, operation is required. It may be one of the most difficult in surgery with an average mortality of 19 per cent. Five per cent is assumed as the average mortality of gastrojejunostomy, but if 18 per cent of the survivors develop jejunal ulceration which has an operative mortality of 22 per cent, the total death rate following gastro-enterostomy will eventually be 9 per cent. As a skilled surgeon will be able to reduce the operative mortality in cases of duodenal ulcer treated by gastrectomy to 5 per cent, the operation of choice which will give the most satisfactory results is therefore the "physiological gastrectomy."

SAMUEL J. FOGELSON, M.D.

Vergoz, C., Ricard, E., and Homar, J. Contusions and Ruptures of the Small Intestine in Closed Injuries of the Abdomen (Contusions et ruptures de l'intestin grêle au cours des traumatismes fermés de l'abdomen). *Rev. de chir.*, Par., 1934, 53, 723.

The authors review the literature on contusions and ruptures of the small intestine occurring in closed injuries of the abdomen and give the histories of ten cases, four their own and six reported by colleagues. They find that such contusions and ruptures occur most often in the first part of the jejunum near the duodenojejunal angle and next most often in the terminal loop of the ileum near the ileocecal valve. The reason for their greater frequency at these sites is that the first part of the jejunum may be easily crushed against the spinal column and the terminal part of the ileum may be crushed against the promontory of the symphysis.

Wounds of the intestine occurring in closed abdominal traumata may be simple contusions or ruptures, single or multiple, incomplete or complete. They may be accompanied by lesions of the abdominal wall, mesentery, liver, spleen, bladder, pancreas, or kidneys. Peritoneal hemorrhages may result from rupture of the mesenteric or mesocolic vascular arches or the omental vessels. Such hemorrhages are very copious. Hemorrhages occurring from the intestine in the absence of a mesenteric injury are less serious.

Contusions of the abdomen do not necessarily require surgical treatment. Mild contusions of the intestine may undergo spontaneous recovery. How-

ever, even cases of slight injury must be kept under careful observation in order that operation may be performed at the slightest sign of peritonitis. When there is any doubt, exploratory operation is indicated. Prehepatic tympany and a roentgenogram showing an abnormal subphrenic clear spot are decisive and in association with spontaneous or provoked pain at a given spot are absolute indications for operation.

At operation, the entire small intestine should be examined as there may be multiple lesions. If lesions are found they must be exteriorized and the peritoneal cavity dried as completely as possible. Simple ecchymoses may be buried by means of a purse-string suture. It remains for the surgeon to decide whether the injury is serious enough to threaten secondary perforation. If there is any danger, the lesion may be buried, resected, or covered with a graft of omentum by Dambrin's method. However, the authors believe that Dambrin's method is indicated only in cases of superficial lesions. For cases of total transverse rupture, end-to-end enterorrhaphy seems to be the simplest and most rapid method. If there are multiple lesions the entire injured segment should be resected. Unless operation is performed within the first few hours it is advisable to establish free Mikulicz drainage of the pouch of Douglas. The gauze should not be left in contact with sutures as on removal of the sutures fistulae may be established. Radiating tears of the mesentery without involvement of important vessels may be simply sutured. If tears of the mesentery are not treated they may cause occlusion from hernia. When extensive contusions of the mesentery and juxta-intestinal tears or dissections are found, the segment of intestine in which vitality is threatened should be resected even if the intestine is intact. Mesenteric lesions of the upper part of the intestine are more dangerous than those of the lower part.

The mortality of these operations is high and increases with the length of time elapsing after the injury.

AUDREY GOSS MORGAN, M.D.

Ehnmark, E. Intestinal Intussusception at Cæcal Tumors. *Acta chirurg. Scand.*, 1935, 76, 147.

In the literature are described at least 132 cases of cæcal tumor with intestinal intussusception. The author discusses particularly 34 which have been reported since 1912 and 7 from the Surgical Clinic of the University of Upsala. He describes the symptoms and the clinical variations of intussusception caused by cæcal tumors, and discusses the diagnosis, especially the roentgen diagnosis.

Since, of 10 cæcal cancers treated in the Upsala Clinic, 4 were certainly, and 1 was probably, associated with intussusception, the author believes it justifiable to assume that intussusception is fairly common in this condition.

In conclusion he emphasizes the importance of examining cases of cæcal tumor with regard to intussusception, especially by roentgen examination. He states that, if possible, the roentgen examination

should be made during an attack of pain because at other times the intraluminal pressure is usually reduced and may therefore escape diagnosis.

Wolfer J. A. J. Jejunostomy with J. Jejunum Alimentation. *Ann Surg* 935, or 708.

Up to within the last few years many attempts at jejunal alimentation were made, but most of these failed because of the use of an incorrect pabulum and a lack of understanding of gastro-intestinal physiology. The records show that as early as 1845 jejunal alimentation was recommended and used for the treatment of carcinoma of the pylorus and attention was called to the importance of placing the stomach and duodenum at rest in the presence of ulceration. In 1897 Henshaw made some interesting studies of the acid curve with jejunal alimentation in the presence of ulcer. He found that when properly selected diet was used there was marked decrease in the free and combined acid and in many instances the total gastric secretion was decreased. In an elaborate experimental investigation carried out in 1913 Scott and Ivy proved that a well-selected diet introduced into the jejunum would maintain an animal in a proper nutritional state for many months and prolong the latent period during which no acid was secreted. During a period of nine hours of continuous jejunal feeding no hunger contractions occurred. The gastric phase of gastric secretion was eliminated by withholding everything by mouth. The pabulum consisted of water, 3,000 cc; cane sugar, 50 gm; peptone (dried), 100 gm; wheat flour, 300 gm; whole milk, 1,000 cc; and cream (30 per cent fat), 1,000 cc, with sufficient salt to maintain the chloride balance and such vitamins as are contained in cod-liver oil, viosterol, yeast, and citrus juices. The observations made in these experiments suggested that in the human being excessive acid secretion might be reduced by adequate jejunal alimentation and the stomach placed at rest by continuous jejunal feeding.

In the procedure followed by the author, W. used jejunostomy is used, the jejunal catheter is inserted at least 8 in. into the lumen of the jejunum, and the gut is fixed to the abdominal wall. The catheter is drawn through a stab wound on the left side of the abdomen or through the lower end of the laparotomy incision if the latter is made on the left side.

Considerable care is necessary in jejunal feeding. The pabulum must be introduced slowly to simulate the emptying of the stomach. In the author's cases it is given with a specially designed electrically driven pump which will deliver any quantity desired during a specific time. Three or four hours after the jejunostomy water is slowly introduced, 100 cc or less being given per hour. The pabulum feedings are begun after twelve hours. The Ivy pabulum, modified to meet the requirements of the individual case, is used. During the first twenty-four to forty-eight hours it is diluted with equal parts of water. Feedings are given every hour during the day and night. Each feeding requires from fifteen to thirty minutes,

depending upon the amount, the time after jejunostomy and the response of the patient to the feeding. Too large amounts administered too rapidly will be followed by cramps and diarrhea. In some instances the fat content may be too high, causing bowel irritability or the patient may not tolerate the amount of orange juice given. To determine the ideal diet the tolerance of the particular patient must be established. With care and patience it is possible to provide a well-balanced daily diet which will supply from 3,000 to 5,000 calories and vitamins to prevent vitaminosis.

The indications for jejunal alimentation are:

1. Large ulcerations of the stomach which are not resectable. Jejunum alimentation favors healing of such ulcerations by placing the stomach at rest and abolishing acid gastric secretion. The author cites cases.

2. Carcinoma of the stomach. The distressing symptoms, pain, hunger and thirst due to the carcinoma, can be controlled better by jejunal alimentation than by any other means. The author cites cases.

3. Carcinoma of the lower end of the esophagus. Jejunostomy is preferable to gastrostomy in this condition because it relieves the pain incident to the involvement of the cardia which is present in many cases. A case is reported.

4. Duodenal ulcer with acute exacerbations associated with excessive vomiting and marked nutritional disturbances. Because of the persistent vomiting, the nutritional state of the patient becomes vital problems. Moreover the large amounts of salts administered and the loss of chlorides incident to the vomiting often lead to alkalosis. In many cases the duodenal tube is prevented from passing through the pylorus by organic obstruction due to the ulcer or by spasm. In such cases jejunostomy affords means of nourishing the patient and supplying minerals and vitamins to maintain proper nutritional and chemical balance and the physiological effect of jejunal feeding favors healing of the ulcer. A case report is cited.

5. Gastric jejunal ulcer. Because of the critical condition of the majority of patients with gastric jejunal ulcer and the technical difficulties encountered in operation for this lesion, jejunal alimentation is recommended to improve the patient's nutritional state and allow the acute symptoms to subside so that operation may be carried out at a time when it is more likely to be successful.

6. Complementary jejunostomy. Jejunum alimentation is indicated (a) to control dehydration and starvation and associated chemical changes after gastro-enterostomy followed by persistent vomiting (a case is cited) (b) to provide the poorly nourished patient with sustenance and favor healing of the anastomosis after gastric resection and (c) in miscellaneous cases in which, at the time of operation, it appears likely that persistent postoperative vomiting will occur (case of acute pancreatitis with fistula and eversion is cited).

7. Limitis plastica
8. Excessive trauma to the stomach
9. Pernicious vomiting after gastro-enterostomy
10. Extragastric or duodenal lesions associated with marked nutritional disturbances and excessive vomiting, pancreatitis, cases of long continued drainage of the gall bladder or common duct with nutritional disturbances, and the pernicious vomiting of pregnancy
11. Selected cases of gastric and duodenal hemorrhage

Gabriel, W. B., and Lloyd-Davies, O. V. Colostomy  
*Brit J Surg*, 1935, 22, 5-9

As a palliative operation in malignant disease of the rectum colostomy is of value chiefly because it relieves obstruction and to a varying degree important and troublesome symptoms such as diarrhea, tenesmus, pain, bleeding, and discharge.

In some cases, such as those with obstruction and a rectovaginal, rectovesical, or vesicocolic fistula, the relief is marked. In most cases the operation is followed for a varying number of months by definite improvement in the general as well as the local condition. This is to be accounted for by the patient's ability to take a more normal diet, proper bowel evacuations, relief of the rectal irritability and more regular sleep. Colostomy is therefore a valuable operation for the relief of inoperable rectal carcinoma.

The benefits conferred by colostomy are most appreciable if the operation is done at a stage when the patient is still capable of general improvement and has time and courage to become adapted to a colostomy life. If it is not done until a late stage of the disease the operative risks are greatly increased as the patient is often in a poor state of health, undernourished, dehydrated and worn out by loss of sleep from diarrhea, tenesmus and pain. The operative mortality in advanced cases is considerably greater than that in cases in which excision of the rectum is either planned or carried out as a second stage operation.

The causes of 79 operative deaths in 970 cases of colostomy studied were as follows:

Cause of death	Cases
Heart failure	11
Pulmonary complications	11
Pulmonary embolism	2
Peritonitis	12
Paralytic ileus	9
Mechanical obstruction	5
Toxæmia from pre-operative obstruction	4
Prolapse of the small intestine	9
Uræmia	6
Cachexia	5
Miscellaneous conditions	5

The following late complications are known to have occurred after colostomy:

1. Stenosis. This is the most frequent complication. It is due to the development of a contraction ring of fibrous tissue at the junction of the skin and

mucous membrane at the colostomy. The musculature of the abdominal wall plays no part in its occurrence.

2. Ventral hernia. This occurred in a small number of cases, not exceeding 10 per cent of the total number, and was slightly more frequent after left iliac colostomies than colostomies in which the bowel was brought out through the left rectus.

3. Spur retraction. This is an important complication which results in complete dysfunction of the colostomy with the passage of feces into the distal colon and is often found in conjunction with stenosis, subcutaneous bulging, and ventral hernia.

4. Prolapse. This is a rare complication. Like a rectal prolapse, a colostomy prolapse may be complete (entire thickness of the colon) or incomplete (mucous membrane only). Usually it occurs from the upper opening, occasionally from the lower opening, and sometimes from both.

5. Fistula into the colon. This is probably due to the ligation of appendices epiploicæ containing diverticula.

The authors describe an operative technique for colostomy an important feature of which is immediate opening of the bowel. It is applicable both to cases with and cases without obstruction. It has considerably reduced the mortality and will probably prevent many of the late complications.

SAUEL KAHN, M.D.

Stone, C. S., Jr. Acute Appendicitis in Children  
*Irch Surg*, 1935, 30, 340

Stone reviews 358 cases of acute appendicitis in children in which the diagnosis was proved by operation. The incidence of the condition reached a peak at the twelfth year of age and remained high during the following two years. The findings of this and similar studies indicate that there is a gradual increase in the frequency of acute appendicitis from infancy to adult life rather than a sharp increase at any one age period.

Acute appendicitis was found to be most frequent in children in the months of June, July, and August. As gastro-intestinal disturbances are common at that time of the year, these conditions may be of importance in the etiology of the condition.

A definite history of one or more previous attacks of acute appendicitis was given in 64 of the cases.

The general clinical picture of the disease was found to be similar in children to that in adults. The distribution of cases in the 3 groups—Group 1, cases of acute appendicitis not ruptured, Group 2, cases of acute ruptured appendicitis, with localized peritonitis or definite abscess formation, and Group 3, cases of ruptured acute appendicitis with no localization of the peritonitis—was essentially the same in the 2 periods of life. The mortality in Groups 1 and 2 was the same in cases of children and adults, but in Group 3 the mortality in the cases of children was 34 per cent whereas the mortality in the cases of adults was 16 per cent. This high figure in cases of Group 3 in children accounts largely for the differ-

ence in the total mortality 7.75 per cent in children and 2.9 per cent in adults.

The high mortality in children is due to the lower resistance of the young to peritoneal involvement. It is obvious that reduction of the mortality can be accomplished best by early diagnosis and removal of the appendix before involvement of the peritoneum.

SARCEY KARY M.D.

Driesen, E. M., and Zollinger, R.: Acute Tuberculous Appendicitis. *Ann. Surg.* 1933 • 740

Of 5,149 appendices examined at the Peter Bent Brigham Hospital, Boston, in the past twenty years, tuberculous appendicitis was found in 16 (0.3 per cent). Of the patients with tuberculous appendicitis, 9 were females and 7 were between the ages of fifteen and thirty years. In 12, the condition was of the ulcerative type. Perforation of tuberculous ulcer may be the cause of an appendiceal abscess. In 4 of the cases reviewed the tuberculous as of the hyperplastic type. This type of lesion is most readily diagnosed at operation, often by macroscopic examination, and offers the best possibility for pre-operative diagnosis. The tumor is frequently palpable abdominally. In some cases it may be mistaken at operation for malignancy. The consensus of opinion is against primary infection of the appendix by way of the blood stream. As the caecum is often involved, the appendix is generally believed to become infected by direct extension and by infected contents.

The ulcerative or caseous type of tuberculous appendicitis usually shows no definite symptomatic pattern or distinguishing features to differentiate it from the ordinary acute or recurrent appendicitis. In 9 of the 12 reviewed cases of the ulcerative type the diagnosis of tuberculous appendicitis was not considered before operation. The cases to which a correct pre-operative diagnosis was made are reported in some detail. In the 4 cases of hyperplastic tuberculous of the appendix the condition was not diagnosed pre-operatively and no other tuberculous focus was suggested by physical examination. Therefore in 2 of the 6 cases the appendiceal lesion found at operation was the first evidence of tuberculous discovered.

In summarizing, the authors emphasize that the pre-operative diagnosis of tuberculous of the appendix seems to depend on the presence of at least 2 of the following factors: (1) longer duration of the symptoms than in the case of acute appendicitis without a fulminating course, (2) poor nutrition and loss of weight, (3) known tuberculosis, (4) diarrhea, (5) failure of the temperature to rise above 100.5 degrees F. (6) absence of vomiting, and (7) the presence of a tumor in the right lower quadrant of the abdomen. None of these is of any significance alone, but the presentation of several of them should suggest tuberculous appendicitis.

Drainage was employed in five of the sixteen cases. Stomach developed in five of the five cases in which primary drainage was employed and in one case in

which drainage was not established at operation. The prognosis was poor in both types of the condition, but perhaps better in the hyperplastic than in the ulcerative type. Of the eleven patients with the ulcerative type, only one remained well. The following information obtained in five cases operated upon recently as of little value as the length of time since the operation was too short to allow accurate conclusions regarding the end-results.

Lahay F. H., and Cattell, R. B.: Two-Stage Abdominoperitoneal Resection of the Rectum and Rectosigmoid for Carcinoma. *Am. J. Surg.* 1933 27: 301.

Lahay and Cattell have devised a two-stage abdominoperitoneal resection of the rectum which has the advantages of the one stage abdominoperitoneal resection described by Miles and therefore may be a wider application than the latter especially in the cases of patients who are poor risks. The technique is as follows:

#### FIRST STAGE

A left rectus incision splitting the fibers of the rectus longitudinally at the junction of the middle and outer thirds of the muscle is made. The deep epigastric vessels are ligated and divided in the lower angle of the incision. The peritoneum is opened and thorough abdominal exploration is carried out.

The redundant sigmoid loop is then drawn toward the median line and the peritoneum divided approximately 1 cm. from the edge of the bowel from a point high on the sigmoid down to a point directly over the iliac vessels. Next, a point on the sigmoid is selected for later division carried out in such a way as to leave an adequate amount of bowel proximally to form the permanent colonostomy and sufficient bowel distal to the point to permit its delivery well over the median line after the division. The peritoneum over the mesentery of the sigmoid is then divided on its medial aspect down to the position of the superior hemorrhoidal vessels and the same division is carried out on the lateral surface. When the mesentery loop is held up the vessels stand out clearly and can be secured with small pieces of mesentery. It is very necessary to identify the superior hemorrhoidal vessels by palpation. These vessels are felt over the sacral promontory slightly to the left of the median line. Particular attention is paid to the course of the upper branches of the left colic artery which provide the circulation to the proximal segment.

A short stab incision is next made suprapubically in the midline. The peritoneum is opened at a point above the bladder. Through this incision a right-angled or long curved clamp is introduced and applied to the bowel distally at a point selected for division. A second straight clamp is placed on the proximal segment through the original incision and the bowel divided with the cautery. The distal segment is brought out suprapubically without contact with the peritoneum and the skin is implanted loosely about 1 inch. This completes the implantation.



The wound is walled off with gauze pads and the lumbar gutter is closed by interrupted or continuous sutures approximating the parietal peritoneum in a direction vertical to the bowel segment. The free edge of the omentum is drawn down and anchored to the medial mesocolic peritoneum at a point directly above the superior hæmorrhoidal vessels. The right side of the free edge of the omentum is approximated along the cut edge of the distal loop up to the peritoneum and is attached to the peritoneum under the stab wound. In a similar fashion the left side of the free edge of the omentum is attached to the mesentery of the proximal loop up to a point where it will be withdrawn from the abdominal wound. Next, the primary incision is closed in layers without drainage. The permanent colostomy is brought out near the middle of the incision. No sutures anchor the bowel wall to the abdominal wound. It is quite essential for an inch or more of the bowel forming the permanent colostomy to project beyond the skin surface.

The clamp is removed from the permanent colostomy after forty-eight hours. After five days the lower clamp becomes detached or is removed and the distal segment of bowel is irrigated two or three times daily until the second stage of the operation is performed.

The average length of time between the stages is fifteen days.

#### SECOND STAGE

The permanent colostomy is walled off with adhesive. The implanted loop is then closed by interrupted and continuous sutures and the abdomen opened just above the umbilicus in the midline, well above the implanted loop. The skin incision is continued downward to encircle the implanted loop. A piece of rubber tissue is tied around the implanted loop to prevent contamination. After the omentum is freed from the distal segment the pelvis is exposed adequately. The superior hæmorrhoidal vessels are ligated at the pelvic brim. The ureters are exposed and identified. The hollow of the sacrum is cleaned out by blunt dissection down to the tip of the coccyx. The entire distal segment of bowel is placed in the pelvis in the presacral space. The pelvic peritoneum is then closed off. The abdominal incision is closed without drainage by means of retention sutures. A small suprapubic drain may be inserted down to the anterior peritoneum. The perineal part of the operation is carried out with the patient in a modified Sims position. The anus is sutured shut and excised toward the coccyx. Following division of the subcutaneous tissues, the coccyx is removed and the middle sacral artery secured. The distal bowel segment is delivered with the perineal dissection carried far laterally so as to sever the levator ani muscles. The large pelvic cavity is then inspected for bleeding and drainage is established by one cigarette drain through the middle of the closed incision. A blood transfusion of 500 c.cm. is given routinely by the citrate method.

JOHN W. NUZUM, M.D.

Rankin, F. W. Graded Perineo-Abdominal Resection of the Rectum and Rectosigmoid. *1st J Surg*, 1935, 27: 214.

Graded operations for cancer of the rectum are usually done for the following reasons: (1) inability of the patient to stand a formidable radical resection in one stage, (2) inadequate decompression as shown by œdema and thickening of the bowel wall with infiltration in the mesentery, and (3) borderline operability.

Graded maneuvers are usually carried out in the following two stages: (1) exploration and decompression by cœcostomy or the formation of a permanent single barreled colostomy, and (2) removal of the segment of bowel containing the growth together with the gland-bearing tissues.

Most satisfactory for exploration is a low midline incision. Muscle splitting incisions have the disadvantage of favoring prolapse and herniation of the colon. When colostomy is done at the initial maneuver in the author's cases it is accomplished through a small stab wound in the left groin. Rankin is convinced that the low midline incision is more desirable for both exploration and the first stage of the graded maneuver. He explores the liver first, then the pancreas and retro-aortic glands, and finally the primary growth. The presence of metastases in the glands can often be determined with certainty only by microscopic examination. One of the most important factors to be considered in estimating operability is the fixation of immobility of the growth. Any growth not rigidly immobile should be extirpated if liver metastases are absent. If the growth appears to be removable and a graded operation seems desirable, either a cœcostomy or a single barreled colostomy may be done. If the bowel is œdematous and thickened, the mesentery is infiltrated, and there is evidence of obstruction, decompression with a No. 28 Pezzer catheter is the procedure of choice. The catheter should be large enough to relieve the bowel of gas and fluid contents. Later, irrigations may be carried out through the same catheter. Adequate decompression depends chiefly on evacuation of the gas and fluid contents. In the cases of patients with acute obstruction at the time of examination the establishment of a blind cœcostomy is the ideal procedure. In the technique of colostomy used by the author the sigmoid is pulled well out through the low midline incision and at a convenient spot in the mesentery the blood vessels are divided close to the bowel. The looping arches of the vascular supply to the sigmoid are carefully preserved. The bowel is divided between two Payr clamps, the upper one of which has been thrust through a stab wound in the groin. The second clamp is applied in the opposite direction and the bowel cut across with a cautery. The proximal end is drawn out and the clamp left on to obstruct the bowel completely for from twenty-four to forty-eight hours. The distal loop is inverted and dropped back into the pelvis.

After the establishment of the cœcostomy or single-barreled colostomy a period of from two to six weeks

is desirable before the second stage of the operation for rehabilitation of the patient. In the author's cases rectal irrigations are given from about the tenth day until twenty-four hours before the second stage. The resection constituting the second stage of the operation is a perineo-abdominal type of procedure begun with the patient face down on the table as for a posterior type of resection with the hips elevated and the anus closed with perineal suture. The anus being encircled by two incisions which join and extend up to about the middle of the coccyx, an extensive dissection of the pelvis up to the peritoneal reflection is accomplished. It is important to clear out the hollow of the sacrum and the ischio-rectal fossae and remove a large portion of the levator ani muscle. This permits also removal of the gland-bearing theses around the prostate and seminal vesicles in the male and the posterior vaginal wall and cervix in the female. The dissection follows disarticulation of the coccyx from the sacrum. The lateral dissection on each side is carried completely up to the peritoneum without opening of the latter. At this point the rectum is encased in a rubber glove, the glove is tied tightly around the cuff and pushed back into the hollow of the sacrum, and the posterior wound is closed. This stage of the operation is carried out under transverse block anesthesia. On its completion the patient is placed on his back and the second part of the operation is carried out through a low midline incision under ethylene anesthesia. The operation is done entirely within the pelvis, which is packed off with gauze. After the turned-in loop of bowel has been located the peritoneum over the inferior mesenteric vessels is incised and both ureters are identified. The inferior mesenteric vessels are doubly ligated close to their origin. The bladder is separated away from the rectum and the entire segment of bowel lifted out through the abdomen. The pelvic floor is restored with the remaining peritoneum. The abdominal wound is then closed and drainage of the pelvis is established by opening the posterior wound and inserting a quantity of gauze encased in oiled silk.

At the end of sixty hours the drains are removed from the posterior wound and daily irrigations of normal saline solution are begun. At the end of ten days the patient is allowed Sitz bath. The large cavity heals readily by granulation. During the period of decompression the pre-operative administration of an intraperitoneal vaccine of mixed streptococci and colon bacilli proves its value in aiding the patient to withstand potential peritoneal contamination. Decompression is the most important fundamental. Also of great importance is the use of blood transfusion.

About 50 per cent of all patients are operable in the sense that there is good chance for clinical cure. The average mortality of the operation performed by an experienced surgeon is about 10 per cent. The operation has been performed by the author in eighty-nine cases with eight deaths.

JOHN W. NIXON, M.D.

# LIVER, GALL BLADDER, PANCREAS, AND SPLEEN

Debusch, L. A Contribution to the Treatment of Cirrhosis of the Liver by the Talma Operation (*Ein Beitrag zur Behandlung der Lebercirrhose mit der Talmaschen Operation*). *Mitt. d. Grenzgeb. d. Med. u. Chir.* 1914, 43, 566.

The author made a clinical study of a number of cases of cirrhosis of the liver in which the Talma operation had been performed (transplantation of the omentum into an extraperitoneal pocket so the rectus abdominis with fixation to the muscle and posterior fascial layer). On the basis of the clinical course these cases could be divided into three groups.

In those of the first group successful early operation was performed. In two cases hemorrhage from esophageal varices was the first sign of liver disease. In two others a previous general infection explained the relatively short duration of the disease. The effect of the operation in these four cases was so good that for from three to ten years later the patients felt well and were able to work again in some extent.

In the second group are four cases which were unimproved by the operation. These are cases of advanced cirrhosis. The development of anastomoses was too late. In such cases it is advisable to test the function of the liver to determine the condition of the diseased organ.

In the third group were cases in which the results are unfavorable. In those in which death occurred within from eleven to sixteen days after the operation the chief symptoms were due to circulatory insufficiency. Because of the severe injury caused by the cirrhosis of the liver intraperitoneal operations are poorly tolerated.

The Talma operation is justified by its favorable results and the theory that the chief symptom which in many cases is responsible for the unfavorable outcome may be alleviated by creating new and beneficial anastomotic relations. Of most importance in establishing the indications is knowledge of the duration of the disease. The operation should not be performed upon a patient with circulatory impairment and severe liver insufficiency.

(Z. ENG.) LEO M. ZIMMERMAN, M.D.

Dahle, M. Rupture of the Normal Spleen Without Known Cause. Spontaneous Rupture? (*Ruptur von normaler Milz ohne bekannte Ursache. Spontanruptur?*). *Arch. klin. u. exp. Med.* 1914, 71, 519.

Rupture of the spleen may occur when the organ is the site of pathological changes, as in malaria, typhoid fever and blood diseases. The possibility of spontaneous rupture has been disputed. The above reports a case of apparently spontaneous rupture. The patient was a boy thirteen years of age. He was admitted to the hospital because of pain in the left side, but the subsequent course of the condition was most suggestive of acute appendicitis. At operation performed twenty-four hours after the onset of the pain the abdomen was found filled with



an infiltration of small cells—mostly lymphocytes—mixed with plasma cells and occasionally large mononucleated or polynucleated cells which starts around the portal vein and extends into the lobules of the liver where it may appear in the form of small bacemias. At the same time there is a proliferation of connective tissue elements which form cicatrices around the vessels and the bile ducts. The degree of fibrosis depends on the severity of the infection. It may vary from only slight excess of connective tissue to true nodular cirrhosis with changes in the normal architecture of the lobules and damage to the liver cells with secondary degenerative changes. The more severe the right abdominal syndrome the more severe the damage to the liver which results from the advent of toxic or bacterial products through the portal vein.

EUGENE T. LEMOT, M.D.

Schildt, E. An Unusual Form of Retroperitoneal Hernia—Hernia Mesenterico-Parietalis Dextra, Broesicke (Ueber eine ungewöhnliche Form von Hernia retroperitonealis—Hernia mesenterico parietalis dextra, Broesicke) *Acta chirurg. Scand.* 935, 76-77.

The most common of the so-called internal hernias are those with an opening showing a topographical relationship to the duodenojejunal flexure and extending beneath the mesocolon descendens or ascendens. Of the left-sided and more common form, about 200 cases, and of the right-sided and less common form, about 40 cases, have been recorded.

The author reports a case of hernia on the right side of a man aged twenty-nine years who had no previous symptoms before the occurrence of an attack of abdominal pain and vomiting. The clinical picture was that of acute diffuse peritonitis. At operation, the small intestine was found twisted around its mesentery in the hernial sac. Withdrawal and detorsion of the intestine and closure of the hernial opening were followed by recovery.

In the author's opinion this condition is best designated by the term suggested by Broesicke, "hernia mesenterico-parietalis dextra."

The pathogenesis of this form of hernia is of interest. Although decisive proofs may perhaps be lacking, there are many factors favoring the theory that such hernia are congenital malformations.

The size of the hernia varies considerably. The contents consist exclusively of small intestine. In the majority of cases all, or practically all, of the small intestine is found in the sac. The hernia are round or oval. They are generally situated in the right side of the abdomen, but may be symmetrically developed in the abdominal cavity. Their relation to the cecum and ascending colon varies. It is common to find these parts of the intestine displaced upward and to the left.

The hernial opening varies in width and is open to the left. There are no or only slight adhesions in the hernia. In some cases, as the result of malformation of the duodenum or the upper part of the jejunum, only an efferent intestinal coil is found.

This hernia is 6 times more common in males than in females. Clinical symptoms occur in at least 50 per cent of the cases. In some cases acute attacks of pain occur without warning. In others, there is a history of prolonged ill health with mild attacks simulating ileus and general dyspeptic disturbances culminating in acute ileus. In a third group there are chronic disturbances of more vague nature.

In 8 cases reviewed by the author the cause of the acute ileus was not stated in the records. In other cases there was division of the intestine in the hernial sac, strangulation in or near the hernial opening, or prolapse of jejunal coils through the hernial opening or the hernial sac.

The diagnosis usually made is "ileus of unknown cause." In the clinical examination the diagnosis may be led right by finding the mass formed by the hernia. Roentgen examination may lead to an exact causal diagnosis.

In the majority of cases the treatment consists in withdrawal of the intestine from the hernia and closure of the hernial opening.

Of 1 patients operated upon, 3 recovered.

Camelin, Y. Cryptogenic Peritonitis Caused by Pneumococci and Related Bacteria (Ueber die durch Pneumokokken und ihnen verwandte Bakterien verursachte kryptogenetische Peritonitis). *Acta chirurg. Scand.* 934, 76-80 pp. 34.

This report is based on ninety-seven cases of cryptogenic peritonitis treated in hospitals in Finland in which pneumococci or similar bacteria were found in the exudate.

Although pneumococcal peritonitis is in general comparatively rare, it is considerably more common in children than in adults. Of the cases reviewed by the author 75 per cent were those of children and only 5 per cent those of adults. The morbidity was greatest in the age of six years. The higher incidence of peritonitis in children is due almost entirely to the great susceptibility of girls up to the age of ten years. Of the cases reviewed, 64 per cent were those of girls ten years of age or younger. The condition is more frequent in females than in males also between the ages of eleven and thirty years, but after the age of thirty years its incidence was about the same in the two sexes (7 per cent).

No variation with age such as that occurring in females was observed in the males. In the latter the incidence of the condition was 14 per cent.

In 44 per cent of the cases the disease occurred in the spring, generally in April. During the other seasons of the year its frequency was about constant.

A respiratory tract affection had been present in twenty-four cases, an abdominal affection in twenty-eight and disease with general symptoms in 39. Peritonitis preceded the perituberculous fairly often. In some cases a chronic disease such as tuberculosis, peritonitis, heart disease, or gastric ulcer was found. Immediate prodromal symptoms occurred in only a few cases. As a rule the peritonitis developed suddenly.

In the majority of the cases the general health was poor, the axillary temperature in the beginning somewhat above 38 degrees C on the average, the rectal temperature over 39 degrees C, and the pulse from 120 to 130 per minute. In 70 per cent of the cases the difference between the rectal and axillary temperature was more than 0.5 degree. Chills were frequent. The complexion was generally pale, but sometimes highly flushed. Occasionally herpes labialis occurred. In half of the number of determinations the leucocytes were found only slightly increased or normal. The highest count was 23,000.

Cultures of the blood were positive for pneumococci once and negative four times. Bacteria resembling pneumococci were sometimes found in the vagina, but no true vulvitis was observed. Albuminuria occurred occasionally, but usually was slight.

The earliest and most constant symptom was sharp abdominal pain. This was absent in only one case. Vomiting occurred in practically all of the cases. In some cases spontaneous diarrhea was absent and in others it did not occur until after from two to fifteen days. Its duration then usually varied from five to ten days. It was absent in 30 per cent of the cases.

Abdominal distention and tenderness were usually fairly pronounced. In 42 per cent of the cases abdominal distention was quite marked. In 30 per cent the abdominal symptoms were more severe on the right side than on the left side. Meteoristic distention of the abdomen was usually present from the onset.

Complications elsewhere in the body developed fairly often during the course of the disease. Pulmonary complications occurred in at least 33 per cent of the cases. Pneumonia occurred in sixteen cases, pleurisy in three, and bronchitis in seven. In one case pneumonia developed before, and in twelve cases after, the peritonitis. In three cases the time of its development was uncertain. There were four or five cases of nephritis and two or three of pyelitis. A septic type of disease occurred in several cases, in one case it began with arthritis.

In eighty-six cases the diagnosis was based on the findings at operation, in nine, on the findings at autopsy, and in two, on the findings of puncture. Abdominal puncture was done four times for abscess and four times for diffuse peritonitis.

In eighty cases the peritonitis was diffuse, the intestines were diffusely injected and generally covered by fibrinous membranes. The exudate consisted chiefly of fibrin. Cases with little or no exudate were exceptional. The exudate varied in its consistency. It was more often thin than thick, and sometimes it was obviously mucous. It was greenish yellow with sometimes a brownish-gray tint. Malodorous pus was never found. The quantity and consistency of the exudate did not seem to depend upon the time of operation.

In fifteen cases an encysted abscess was found. In the majority it was in the umbilical region, but in

some cases it occurred in another part of the abdominal cavity. With two exceptions, diffuse exudate was found only during the first ten days. Encapsulation occurred after the sixth day.

In favorable cases the fever decreased after the operation. In fatal cases a considerable pre-agonal increase in the temperature (up to 42.1 degrees C, rectal) was common.

Spontaneous perforation through the umbilicus occurred in three cases. Secondary abscesses were formed in the abdominal cavity in ten cases. These abscesses were incised. An intestinal fistula developed in five cases. In seven cases a Witzel enterostomy was done because of intestinal paralysis. In one case delimitation of the exudate was still incomplete on the twenty-seventh day of the illness.

The mortality in the total number of cases was 58 per cent, in the cases of children, 55 per cent, and in the cases of adults, 67 per cent. In the diffuse stage the total mortality was 55 per cent. In the cases in which operation was performed during the diffuse stage the total mortality was 62 per cent, the mortality in the cases of children, 60 per cent, and the mortality in the cases of adults, 68 per cent. In the cases in which operation was performed after the diffuse stage or not at all the total mortality was 46 per cent, the mortality in the cases of children, 43 per cent, and the mortality in the cases of adults 60 per cent. The mortality was highest from the fifth to the tenth day of the disease.

The following signs indicate an unfavorable prognosis: a temperature above 40 degrees C, a difference of more than 1 degree between the rectal and axillary temperature, a pulse rate above 130 per minute, albuminuria (thirteen deaths in fifteen cases), absence of diarrhea, the development of intestinal paralysis, and the presence of a large number of bacteria in the exudate. In the cases reviewed, secondary unilateral pneumonia did not seem to impair the prognosis to any considerable extent.

Forty one patients were discharged as convalescents. Of these, three died later (two evidently from sequelae of the peritonitis), two had various disturbances, and twenty-two recovered completely. Fourteen patients could not be traced. According to the findings of the final follow-up, 63 per cent of the patients died, 34 per cent were in good health, and 3 per cent were in poor health.

The author draws the following conclusions:

1. Cryptogenetic pneumococcal peritonitis is most common in girls up to the age of ten years.

2. It is always, or nearly always, diffuse in the beginning. Encapsulation usually occurs from the seventh to the tenth day, but sometimes not until considerably later. One or several abscesses of varying size then develop, most frequently in the umbilical region. Spontaneous healing may occur.

3. To judge the results of early operation it is necessary to compare the mortality in cases operated upon during the diffuse stage with the mortality in cases not operated upon or operated upon later. Erroneous conclusions are drawn if only cases in

rich the condition was diffuse or encapsulated at the time of operation are compared.

4. Although the difference between the results of early operation and conservative treatment was found to be considerably less than had been expected, it is sufficient to justify expectant treatment when the diagnosis appears reliable. This conclusion seems safe at least so far as children are concerned. In the cases of adults the more cautious procedure is immediate operation if there is the slightest doubt regarding the diagnosis. The time of later operation should be decided on the basis of the findings in the individual case.

5. A diagnosis based on the clinical symptoms is often possible but seldom entirely reliable. It is often impossible to exclude streptococcal peri-

tonitis clinically. It is hazardous to draw conclusions from the bacteria in the vaginal secretion. In doubtful cases, abdominal paracentesis may be done.

6. The vast majority of the patients who recover from pneumococcal peritonitis remain completely free from symptoms, but convalescence may require many months.

7. No definite conclusions can be drawn as to the route by which the infection occurs. Its occurrence by way of the blood stream or intestines seems most probable. Pneumonia apparently seldom plays part in the pathogenesis of the condition as it usually develops later than the peritonitis. The peritonitis of young girls seems to be especially liable to pneumococcus infection.

LOUIS NEWKENT, M.D.

# GYNECOLOGY

## UTERUS

Morgan, T N Studies on the Movements of the Uterus II The Action of Extract of the Corpus Luteum on the Uterus of the Unanæsthetized Rabbit III The Action of Gonadotropic Extracts on the Movements of the Uterus of the Unanæsthetized Rabbit *J Obst & Gynec Brit Emp*, 1935, 42 79, 84

In the experiments reported by Morgan the effect of corpus luteum extract on the movements of the uterus of the unanæsthetized rabbit was correlated with the change in the structure of the uterus. The observations were carried out by making a uterine fistula of one horn of the uterus and treating the rabbit with the extract after its recovery from the operation.

In the first series of experiments sexually immature rabbits were used. After treatment with oestrin until the endometrium showed typical oestrous development, rather large doses of "prolution," a corpus luteum extract, were administered daily. After forty eight hours, the activity of the uterus showed a marked diminution, and at the end of three days the uterus was as quiescent as in pseudo-pregnancy and the endometrium exhibited the characteristics of pseudo-pregnancy. The uterus showed also an increase in size during the treatment with corpus luteum extract. When the injections were stopped the uterus began to show signs of activity after about three days.

The same observations were then made on sexually mature does, first on those in which the ovaries were removed and then on those with intact ovaries. In the former group the response was the same as in the sexually immature group, but in the latter it was quite variable.

From these observations the author concludes that the follicular hormone and the hormone from the corpus luteum exercise respectively augmentor and inhibitor effects on the motility of the uterine muscle, and that the degree of motility depends on the relative concentration of these hormones in the blood.

HENRY S ACKEN, JR M D

Davis, M E, Adair F L, Rogers, G, Kharasch, M S, and Legault, R R A New Active Principle in Ergot and Its Effects on Uterine Motility *Am J Obst & Gynec*, 1935, 29 155

Experimental evidence is presented to show that not all of the desirable physiological activity of ergot is due to its alkaloids. From the non alkaloidal fraction, which has been found to have a marked oxytocic activity on the human postpartum uterus, there has been isolated a new principle which is active in doses of 3 mgm when administered orally. This new principle does not give the usual precipi-

tation reactions with reagents used in the tests for the known alkaloids in ergot. Apparently it contains less than 1 in 100,000 parts of the so-called alkaloids, the smallest relative amount that can be determined by chemical analysis. When the active alkaloids in ergot—ergotamine, ergotoxin, and sensibamine—were given to patients orally in 3-mgm doses, no uterine responses followed within an hour, whereas when the new active principle was administered orally a good characteristic response was noted.

In the cases of over 100 postpartum patients the new active principle was administered and kymographic tracings of uterine activity were made for a period of three or four hours. It was found that the drug evokes a characteristic response within from six to fifteen minutes after its administration. The uterine motility thus initiated persists for three or four hours.

The physiological activity of the new active principle was studied by the usual biological methods. The best medium for biological assay of the new active principle is the human postpartum uterus and the postpartum uterus of the dog.

The new principle is palatable, odorless, faintly yellow, and stable. It does not affect the blood pressure or provoke any undesirable reactions.

EDWARD L CORNELL, M D

Chambers, H The Histological Classification of Cancers of the Uterine Cervix and the Relation Between the Growth Structure and the Results of Radium Treatment. *Am J Cancer*, 1935, 23 1

Histological grading as a means of determining the prognosis and estimating the radiosensitivity of malignant tumors is still of uncertain value despite the work of Broders, Martzloff, Healey, Cutler, and others. Apart from the need for a large series of cases treated by a uniform method and followed for a sufficiently long period of time, the procedure is complicated by the difficulties encountered in attempting to separate cancer growths into distinct and clearly defined groups and by the fact that no method of grading has as yet been generally regarded as entirely satisfactory.

The author's study was undertaken to determine the extent to which the response of malignant tumors to irradiation varies with their histological structure and whether there is evidence to support the theory that tumors of certain histological types (e.g., adenocarcinomata) are insensitive to irradiation. Of 678 cases of epidermoid cancer of the cervix treated at the Marie Curie Clinic, 228 were discarded as unsuitable. The grading of the remaining 450 cases was based on the extent of differentiation and the degree of cell activity, but the general structure

of the growth was also considered. The author grades squamous-cell cancers as follows:

Grade 1: All typical squamous carcinomata of the adult common type. (Incidence, 15 per cent.)

Grade 2: Tumors composed of thin spindle cells resembling those of the basal germinating layer. (Incidence, 9 per cent.)

Grade 3: All tumors in which there is a distinct tendency to form stratified epithelium. (Incidence, 54 per cent.) These tumors are subdivided into keratinized, differentiated, transitional, and anaplastic growths.

Grade 4: Anaplastic growths which show no formation of stratified epithelium. (Incidence, 3 per cent.) These tumors are subdivided into (a) those arranged in alveolar masses with a fair amount of intervening tissue, and (b) those composed of solid mass of cells with little intervening tissue which in some respects resemble sarcoma.

The age incidence of the tumors of the various histological grades is about the same except that there is some indication that the anaplastic growths (tumors of Grade 4) are more common in younger than in older women.

The duration of symptoms seems to have no relation to the clinical stage of the disease (League of Nations classification). In many of the most advanced cases among those entered the symptoms had been present for less than six months and in some of the less advanced cases they were of the longest duration.

The clinical varieties of local growth, namely nodular, infiltrating, ulcerating, crater forming, fungating cauliflower, endocervical, and pyometric, were studied. The cauliflower growths were chiefly of Grades 3 and 4, but every histological type was represented in each clinical variety.

The irradiation treatment used at the Marie Curie Clinic is a modification of Forssell's method. In general, the principles of therapy have not been modified since the Clinic was opened in 1905. Radiation has not been used internally and supplementary deep X-ray therapy has not been employed. The chief object of the treatment has been the direct application of a dose of irradiation large enough to cause the malignant cells to disappear without producing irreparable damage to normal structures. It is, in fact, surface treatment of the uterine cavity and the apical vault. It is to be noted that the damage has been influenced or altered by the histological character of the growth. Although this method succeeds in treating carcinoma cells close to the surface, it fails to destroy or seriously alter the growth of cancer cells situated more deeply or metastases in the pelvic glands. Therefore the results are dependent upon the clinical stage of the disease when the treatment is begun and disappearance of the local growth is of more value in determining the effect on the cancer tissue than is the patient's ultimate condition.

The author reviews the results of treatment not only in the 450 cases of squamous cell cancer which

were graded, but also in 50 cases of adenocarcinoma of the cervix. Of 90 patients in clinical Stages 1 and 2 (League of Nations classification) 80 (89 per cent) have been apparently free of local disease for 1 year or longer since the institution of the treatment. Of those in clinical Stages 3 and 4, 244 (65 per cent) are locally cured. There is comparatively little difference between the various histological grades. However the best results were obtained in cases of transitional cancers of Grade 3 in which the incidence of local cure was 74 per cent, and cases of adenocarcinoma, in which the incidence of local cure was 73 per cent.

The author believes that the treatment used at the Marie Curie Clinic will cure the great majority of growths limited to the cervix (Stage 1) irrespective of their histological type. When the more advanced cases—for example those of Stage 5—are considered separately a difference of not more than 5 per cent is found between the various histological types as far as local cure or the number of three-year survivors is concerned. This is true also when the results in the entire series are considered. Moreover it is quite evident that desiccation carcinomata are not insensitive to irradiation.

GEORGE H. GARDNER, M.D.

#### EXTERNAL GENITALIA

Kirwin, T. J. and Lowrey, O. R. Radical Relief of Vesicourethral Fistula. Report of an Unusual Case of a Section of the Bladder Through the Perineal Opening, and Review of Sixty Cases Seen at New York Hospital During the Past Ninety Years. *J. Urol.* 1933, 33, 5.

The patient whose case is reported was a woman who was thirty-five years of age when the first case under the authors' observation. She gave a history of "bladder trouble" dating from her only confinement thirteen years previously. She had been operated upon five times without relief of the symptoms. The fistula was complicated by complete eversion of the bladder into the vagina. The everted bladder protruded to the vulva. The operation described by the authors was done in two stages. All diverticulated tissue was removed, the bladder being incised almost to the edge of the fistula. Silver wire sutures similar to those used by Sims eighty years ago were used. Suprapubic counter drainage in the scrotum was established to favor healing of the fresh edges of the fistula by preventing their contamination by contact with the urine. The final result was not complete cure, but the patient was benefited.

The authors consider vesicovaginal fistula a urological problem.

HARRIS W. FINE, M.D.

#### MISCELLANEOUS

Kesao, E. Investigations on Cholera in the Venetian Cycle and the Puerperal State. (*Ricerche sulla colera nel ciclo mestruo nelle stato di puerperia*). *Riv. ital. di ginec.* 34, 1-4, 1.

A number of investigators has attributed to bismuth an antagonistic action toward the effect of



adrenalin on the blood pressure, a specific action on the coagulation of the blood, a hormone action stimulating intestinal peristalsis, a hormone action influencing menstruation, and a stimulating action on the uterine muscle initiating uterine contractions during parturition

The author describes an original method for the demonstration of free choline in the circulation. In studies made in the cases of twenty-six women he was unable to demonstrate any importance of this substance in either menstruation or parturition

GEORGE C FINOLA, M D

Cannon, D J. Menstruation and Menstrual Disorders. *J Obst & Gynec Brit Emp*, 1935, 42 88

It is regarded as proved that functional uterine bleeding is due to a disturbance of the endocrine balance which maintains the normal menstrual cycle. The author discusses the physiology of menstruation, Frankl's view of the mechanism of bleeding, the relation between oestrus and the menstrual cycle, the physiology of intermenstrual bleeding, the relation between intermenstrual bleeding and the oestrous cycle in lower animals, metropathia hæmorrhagica, epimenorrhœa, and menorrhagia simplex. He states that the gynecologist is no longer regarded merely as an operating surgeon. With his wider vision, he no longer wastes time on such sterile discussions as the best means of suspending a displaced uterus. He is more interested in the nature and cause of the bleedings which suspension of the uterus has so frequently failed to cure.

J THORNWELL WITHERSPOON, M D

Moore, C R. Hormones in Relation to Reproduction. *Am J Obst & Gynec*, 1935, 29 1

The author discusses (1) the two functional potentialities of the sex glands, (2) the control of the essential accessory reproductive glands, the non-essential characteristics, and, to some extent, the psychic behavior by the homologous sex hormone and the absence of an effect by the heterologous sex hormone, (3) the threshold of effectiveness of hormones, (4) the lack of an effect of gonad hormones on the gonads themselves, (5) the absence in the gonads of the power of self regulation, (6) the modification of hypophyseal activity by the gonad hormones, and (7) the influence of environmental agents on the hormonal activity of the organism.

He states that the two functional potentialities of the sex glands are (1) the maturing of germ cells, and (2) the production of internal secretion or hormones. In the simpler invertebrate forms of life the gonads appear to have only the germ cell-producing function. In the lowest of the vertebrate types as compared with the higher types there is little hormone action. Characteristic of all reproductive processes is periodicity. Reproduction is not a continuously operating process, it usually occurs once a year.

Control of the accessory reproductive organs has been demonstrated to rest upon the internal secre-

tions of the specific or homologous sex gland. In the lower vertebrates, including the mammals, the hormones probably play an important part in stimulating the mating reaction or sex drive, but in primates, especially in man, their function to that end is to be questioned. In keeping with such added complexities of control, more than one hormone has been elaborated. Though these gonad hormones are quite sex specific, they are in no sense species specific.

With regard to the threshold of effectiveness of hormones the author says that it is too rarely appreciated that hormone storage does not occur in the body and that the response of an organ depends upon a minimal hormone level for a period sufficient for the occurrence of such a response.

The general results of injecting gonad hormones into normal animals are injury to the gonads (from either sex hormone) and stimulation of the homologous but not the heterologous accessories.

The gonads function under the remote control of the hypophysis. Substances that stimulate the gonads have been derived from several sources, but it is not to be suggested that these substances from different sources are identical.

There is a reciprocal interaction between the gonads and the hypophysis. The modification may be expressed as an inhibition or a suppression of hypophyseal activity of such a nature that hypophyseal secretions are delivered into the blood stream in reduced amounts.

Certain environmental agents operate in some manner to influence the hormone activity of the organism. In annual breeding forms of animals this added environmental factor operates upon the controlling mechanism that exists in the forms that are not similarly affected by their environment. It is not yet entirely clear whether the environmental factor operates merely to stimulate the activity of the hypophysis or to remove some analyzable inhibition.

EDWARD L CORNELL, M D

Wade, N J, and Doisy, E A. The Prolonged Administration of Theelin and Theelol to Male and Female Rats and Its Bearing on Reproduction. *Endocrinology*, 1935, 19 77

A review of the literature revealed that the ultimate effect of the administration of oestrogenic substances on the reproductive behavior of the male and female animal was uncertain because of the relatively short periods of treatment. The authors conducted experiments over an extended period to determine whether male and female rats can develop normal reproductive hormones, theelin and theelol.

Male rats were injected daily after weaning with quantities of theelin varying from 0.65 to 32.0 y and of theelol varying from 1.65 to 6.6 y. The injection period ranged from one hundred and thirteen to two hundred and forty-two days. Of the 53 rats so treated, 24 successfully impregnated normal females, whereas of 39 control males, 17 sired litters.

The body weight of the injected males averaged 87 per cent of the body weight of the control males.

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#### MISCELLANEOUS

Sasso, E. Investigations on Cholera in the Menstrual Cycle and the Puerperal State (Ricerche sulla colera nel ciclo mestruo e nello stato di puerperato). *Riv. Ital. di Ginec.* 1934, 7 35.

A number of investigators have attributed to cholera an antagonistic action towards the effect of

adrenalin on the blood pressure, a specific action on the coagulation of the blood, a hormone action stimulating intestinal peristalsis, a hormone action influencing menstruation, and a stimulating action on the uterine muscle initiating uterine contractions during parturition.

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EDWARD L. CORNELL, M.D.

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The body weight of the injected males averaged 87 per cent of the body weight of the control males.

The weights of the testes, prostate, and Cowper's glands of the injected rats were less than those of the controls.

Forty-one female rats were injected daily after weaning with quantities of thecol varying from .65 to 3.57. The injections were continued for periods ranging from one hundred and forty-three to three hundred and sixteen days. During this time, 100 matings, 6 pregnancies, and 4 litters occurred. Reproduction was below normal and interference with lactation was apparent. A. F. LANE, M.D.

Trainsa Rao, G. Malignant Melanotic Tumors of the Female Genitalia (Di alcuni tumori melanotici del genitali femminili). *Riv. ital. di ginec.* 1934. 7: 26

The author reports three cases of malignant melanotic tumor of the female genitalia. (1) melanocarcinoma arising from the base of a urethral polyp and extending into both labia minora; (2) melanocarcinoma originating from small mass at the frenulum of the clitoris and extending into the right labium minora; and (3) a melanocarcinoma arising from an ulcer in the lower third of the left vaginal wall.

The treatment in all of these cases was operation supplemented by X-ray and radium irradiation. The first two patients died two months and four months later respectively of other causes. The third was in good health four months after the operation.

A review of the literature revealed that malignant melanotic tumors of the female genitalia are most common between the ages of forty and sixty years.

Melanocarcinoma of the vulva is rare. The author was able to collect only six cases and two of them were insufficiently described. Fraaij, Adair, and Peck state that 3 per cent of all melanotic neoplasms occur in the vulvar region. Toggler found twenty melanocarcinomas among fifty-two sarcomata of the vulva. The reported frequency of melanotic tumors of the vulva ranges from 6 per cent (Winckel, Marietti) to 9.09 per cent (Gorner). The author attributes this wide variation to the difficulty of distinguishing melanocarcinoma from melanocarcinoma.

Melanomata may originate in structures of the internal genitalia which are devoid of pigment or in those of the external genitalia in which pigment normally abounds. Their cause is obscure. The exact cell responsible for them is unknown. Among the more widely accepted theories regarding the origin of these tumors are Deland's theory that they arise from connective-tissue, the Dumas-Coleman theory which attributes them to misplaced embryonic tissue, and Fornero's theory that they are due to the migration of pigment cells. The author agrees with Bloch that melanomata are derived from melanoblast cells. These melanoblasts are epidermal cells of the stratum basalis and spinosum and their function is the production of pigment which is transmitted to the corium for elimination. By means of diisulphenylalanine it is now possible to distinguish melanoblasts from chromatophoric and melanophoric cells. The author believes that this distinction will throw considerable light upon the etiology of the tumors. GREGOR C. FROTA, M.D.

# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

Tata, G. The Influence of the Hormones of Pregnancy on the Growth of Bacteria (Influenza degli ormoni gravidici sullo sviluppo dei germi). *Riv Ital di ginec*, 1934, 17 347

To determine the effect of the hormones of pregnancy on the growth of bacteria the author collected urine and blood from three groups of women—normal non pregnant controls, normal women at various stages of pregnancy, and pregnant women with pathological conditions such as eclampsia, albuminuria, severe vomiting, and vesicular mole—and added serum and urine respectively to a medium appropriate for the growth of the bacillus *Paratyphosus A*. The criteria of growth were the number and size of the colonies.

As compared with the blood serum of the non pregnant women, the blood serum of the pregnant women showed a distinct inhibitory effect on the growth of the bacteria which increased with the advance of pregnancy. The serum of the pregnant women with complications caused an exuberant growth of the bacillus because of its greater content of hormones.

No appreciable difference in growth was noted in the media to which the urine of these groups was added. However, when the growth in media inoculated with serum was compared with that in media inoculated with urine, it was observed that while urine inhibited growth, the serum did not cause an equal hindrance to growth.

In another series of experiments commercial hormones of pregnancy were added to the media. The extracts consisted of prolactin and astrin obtained from urine and an extract of the anterior lobe of the hypophysis. When added to the media in varying unit quantities, they all caused a marked increase in the rapidity of bacterial growth.

The author concludes that, besides these hormones other factors, such as endocrine and nerve factors and an antibacterial agent, may have influenced the results reported.

CLARA RAVEN

Ulusia J B. Studies on Ammonia in Eclampsia (Studien ueber das Ammoniak in der Eklampsie). *Zentralbl f Gynaek*, 1934, p 1754

The ammonia content of the blood during pregnancy and in eclampsia was determined by the author by the method of Folin. The findings of Bock, who noted an increase in the ammonia content of the blood during pregnancy, were confirmed. Ulusia found that in pregnancy the blood ammonia averaged 0.26 mgm per 100 c.cm in pre eclampsia, 0.56 mgm, and in eclampsia 0.81 mgm. During an attack of eclamptic convulsions it rose to 1.36

mgm per 100 c.cm. In the puerperium it returned rapidly to normal. In eclampsia the amount of ammonia in the urine also increased while the urea content of the urine was decreased. In the author's opinion it is unlikely that nitrogen retention is responsible for the increase in the blood ammonia. The increase is probably due to liver insufficiency. This is suggested by the ammonia-urea quotient in the blood.

Determinations of the hydrogen-ion concentration and carbon dioxide tension of the blood indicated that in eclampsia there is a slight acidosis.

The amount of ammonia was found to be less in the umbilical blood than in the maternal blood and greater in the umbilical vein than in the umbilical artery. The fetal liver changes the ammonia into urea. Determinations of the urea and ammonia content showed only small amounts. Apparently the placenta is of no importance in the formation of ammonia. The attacks of convulsions, but not the other symptoms of eclampsia showed a relationship to the increase in the ammonia in the blood.

(MUEHLBOCK) JOHN W BRENNAN, M D

Peckham, C H. An Analysis of 127 Cases of Eclampsia Treated by the Modified Stroganoff Method. *Am J Obst & Gynec*, 1935, 29 27

In the period from October 15, 1924, to February 15, 1933, 127 cases of typical eclampsia were observed on the Obstetrical Service of the Johns Hopkins Hospital, Baltimore, and routinely treated by the modified Stroganoff method. There were 14 maternal deaths, a mortality of 11.02 per cent. The death rate was highest in the postpartum variety and lowest in the intrapartum variety of the condition. Since the use of the Stroganoff treatment the mortality has been less than half the mortality under the old radical forms of treatment. In cases of the mild type according to the classification of Eden it was 2.86 per cent, and in those of the severe type, 21.05 per cent.

The author presents a modified classification which he believes is a more exact criterion of the prognosis than Eden's original classification. A case is classified as severe when 2 or more of the following factors are present: (1) a temperature of 103 degrees F or above, (2) a pulse rate of 120 or over, (3) a systolic blood pressure of 180 or over, (4) deep and persistent coma, and (5) 20 or more convulsions.

In 102 cases of eclampsia classified as mild according to this classification there were no deaths whereas in 103 which were classified as severe there were 15 deaths, a mortality of 24.27 per cent.

The maternal mortality is somewhat higher in the white than the black race. In the cases reviewed it was increased also in multiparous women and in the

case of a woman late in the child-bearing period of life. In the mild form of case the modified Stroganoff treatment gives quite satisfactory results. In severe cases it is preferable to the old forms of radical treatment. In severe cases becoming worse under conservative therapy cesarean section under local or spinal anesthesia seems permissible.

EDWARD L. CORRELL, M.D.

Schuman, W.: Heart Disease Complicating Pregnancy. *Am. J. Obst. & Gynec.* 1935, no. 64.

Of the 5 cases of heart disease complicating pregnancy which are reviewed by the author were seen in the period between January 1933 and November 30, 1933 when 98 women were delivered on the ward service. Heart disease therefore occurred in 1 of every 44 cases or 2.3 of every 100 cases of pregnancy. Two (8 per cent) of the women with heart disease died as the result of the pregnancy and 1 died more than six months after delivery of subacute bacterial endocarditis.

Eleven of the women with heart disease gave definite history of rheumatism. The same number had a previous history of cardiac disturbances. Fourteen had no previous knowledge of a cardiac condition. In the cases of 3, the cardiac disease was not recognized until labor or the puerperium. According to the physical signs, the double mitral lesion was the most frequent, 1 of the 5 women having mitral stenosis and insufficiency. Next in frequency were mitral stenosis and mitral insufficiency each of which was found in 5. One patient had aortic insufficiency and mitral stenosis, and another, combined aortic and mitral insufficiency. In 7 of the 14 cases with a double mitral lesion and 4 of the 5 with mitral stenosis alone the cardiac disturbance was severe, whereas in 3 of the 5 with mitral insufficiency it was mild.

The treatment was based on the requirements of the particular case. In 8 of the 5 cases delivery occurred at term. In 6, the pregnancy was interrupted and in 1 the woman died undelivered. In 6 cases cesarean section with sterilization was done at term, and in 4, before the child became viable. Abortion was induced in 1. The pre-operative preparation consisted of absolute rest in bed in the hospital for from three to fifty days, supplemented, in some cases, by digitalization.

Pregnant women with severe cardiac conditions must be treated individually. The parity of the patient, the period of gestation at which she is first seen, her ability to obey instructions, her religion, her desire for children, the advisability of sterilization, and the presence of other complications must all be taken into consideration. When a woman with decompensated cardiac lesion is seen in the early months of pregnancy the treatment of choice is abdominal hysterectomy and sterilization after the restoration of compensation. When she is seen for the first time after the period of viability, bed rest until the return of compensation followed by cesarean section and sterilization performed under

either or local anesthesia gives the best prognosis for mother and child.

EDWARD L. CORRELL, M.D.

Fitzgerald, J. E. The Management of Pregnant Women with Heart Disease. *Am. J. Obst. & Gynec.* 1935, no. 52.

Of 9,000 pregnant women, 350 are referred to the Heart Clinic, and of the latter, heart disease was found in 126. Therefore the incidence of heart disease in the prenatal clinic was 0.66 per cent.

Of the 126 women with heart disease, 97 had mitral disease and of the latter 6 showed evidence of stenosis. Twenty-five are colored. Only 1 had a positive Wassermann reaction. Eleven gave a history of previous heart failure. Thirty-seven have been under observation for more than five years. Only 6 gave a history of rheumatism.

Twelve of the women had aortic disease. Of these, 8 were twenty years of age or younger. Nine were colored. Five of the colored women had positive Wassermann reaction. Half of the group came under observation in their first pregnancy. The entire group has been in the clinic for an average time of six years.

There were seven patients with combined mitral and aortic lesions. All had negative Wassermann reaction. Their average time in the clinic has been six years. Six gave definite history of rheumatism or rheumatic fever.

The most common symptom was dyspnea on exertion. Of the women with mitral disease, 28 had intermittent dyspnea. The next most frequent symptom was edema, but this is rather common in late pregnancy and does not necessarily indicate myocardial strain. Nineteen of the 97 women with mitral disease, 3 of the 12 with aortic disease, and 4 of the 9 with combined lesions had chronic cough.

The author calls attention to the fact that of 96 women with severe injury of the heart, 35 had no symptoms at all. He states that when heart failure is prevented during pregnancy, disaster during labor or in the postpartum period is very rare. He has found that in the absence of obstetrical complications normalizing other procedures delivery by way of the vagina yields extremely good results.

EDWARD L. CORRELL, M.D.

Mahon, R. The Obstetrical Prognosis of Large Uterine Fibromata (Le pronostic obstétrical des gros fibromes utérins). *Rev. franç. de gyn. & d'obst.* 1934, no. 641.

Mahon reports that at the Obstetrical Clinic of the College of Medicine of Bordeaux, 4 fibromata were found in 1,000 women delivered in the period from 1910 to 1933. Nineteen of the fibromata are the size of man's fist or larger. Thirteen of the 9 large fibromata are found in primiparae. The primiparae with large fibromata averaged thirty-four years of age. Only 4 of them were under thirty. Only 1 aborted. Eighteen went to term or were delivered of viable infant nearly 1 term. Attention is called to the fact that cases in which prof-

nancy is interrupted very early do not come to an obstetrical clinic

In 13 of the 19 reviewed cases of large fibroma the pregnancy was entirely normal. In 5, pain occurred during the course of the pregnancy, suggesting the possibility of necrosis of the tumor, but in all was relieved by medical treatment. In no case was operation performed.

The 18 cases of delivery at or near term included 1 case of placenta prævia in which cesarean section and hysterectomy were done, 1 case of breech presentation in which extraction was accomplished easily, 2 cases in which high forceps were applied, 3 cases requiring surgical intervention (not including the case of placenta prævia), and 12 cases of spontaneous delivery. In 5 cases the postpartum period was complicated by an infection which yielded to medical treatment. In 1 of the latter the symptoms suggested also torsion of the fibroma on its pedicle.

All of the 19 mothers were discharged from the clinic in good condition. Four had been subjected to hysterectomy. Seventeen of the children lived and developed normally. One infant, the child of a syphilitic mother, was stillborn.

From his study of these cases and a review of the recent literature the author concludes that pregnancy has a definite effect upon fibromata in the uterus. During pregnancy, uterine fibromata tend to hypertrophy, soften, and become necrotic. Very considerable necrosis may occur without causing clinical symptoms. Gangrenous or suppurative degeneration of a fibroma in pregnancy is rare. Pregnancy may be responsible for torsion of a pedunculated fibroma. While the necrosis of a fibroma during pregnancy may not produce symptoms, it increases the chance of postpartum infection.

Uterine fibromata tend to prevent pregnancy and, if conception takes place, favor the occurrence of abortion or miscarriage. Their effect is due in part to the changes in the endometrium with which they are associated.

Fibromata interfere with the course of labor in various ways. Large fibromata, especially if pedunculated or arising from the posterior wall of the uterus, may cause mechanical interference and prevent engagement of the head. Multiple fibromata may infiltrate the uterine wall and interfere with normal uterine contractions. Either form may cause an abnormal presentation. Recent statistics and the occurrence of 12 spontaneous deliveries in the 18 cases reviewed by the author show that interference with labor occurs less frequently than might be expected.

Mahon is convinced that the prognosis of large uterine fibromata from the obstetrical view is not unfavorable for either the mother or the child. Surgical interference is usually not indicated during pregnancy. A trial of labor should be permitted at term to determine the degree of dystocia caused by the fibroma. Surgical intervention will sometimes be necessary. Under such conditions the author prefers low cesarean section followed usually by hys-

terectomy but sometimes by myomectomy. When symptoms of puerperal infection develop in a fibromatous uterus, curettage is not indicated. If surgical treatment is required, hysterectomy is the procedure of choice.

Alice M. Meyers

Pilloni, S. A Case of Abortion Due to Psychic Trauma (Su di un caso di aborto per trauma psichico). *Clin. ostet.*, 1934, 36, 768.

The author reports a lawsuit brought against a man for the induction of abortion by psychic trauma. During the evening of May 1, the woman, who had been amenorrhœic for two months, was frightened by the threats of the accused and thereafter experienced a bloody discharge from the vagina. The discharge continued for two days, but as she believed it due to the onset of the menstrual period, it caused her little concern. On the third day, however, she began to have intermittent abdominal cramps, and after a few hours a mass of coagulated tissue was expelled from the vagina. A physician was called, but examined neither the extruded mass nor the patient. The woman continued to bleed for two weeks, during which time she was not under the observation of a physician. On May 26 she entered the hospital and was subjected to uterine curettage.

The author reviews the developments at the trial and the legal and medical questions involved. These led to the legal opinion that the abortion might well have been precipitated by the psychic trauma.

A. Louis Roser, M.D.

## LABOR AND ITS COMPLICATIONS

Hayes, W. I. Cesarean Section. A Review of 486 Consecutive Operations at the Women's Hospital, Melbourne. *Med. J. Australia*, 1934, 2, 799.

In the period of fourteen years from July, 1920, to June, 1934, 40,183 women were delivered in the Women's Hospital, Melbourne, Australia. Of these, 486 (1.2 per cent) were delivered by cesarean section. The incidence of cesarean section was higher than in private practice because of the greater number of abnormal cases admitted to public hospitals and the tendency of women with abnormal deliveries to return to the same hospital for subsequent deliveries. In the cases reviewed, both the classical and the lower uterine segment operations were done. The latter was usually performed when the patient had been in labor for some time. Of the mothers, 29 (5.9 per cent) died. Of the children, 41 were stillborn and 23 died soon after birth, the total infantile mortality being therefore 13 per cent (6.4 deaths).

Of the maternal deaths, 2 per cent were caused by the operation and 3.9 per cent were attributed to the condition for which the operation was performed.

Disproportion, obstructing tumors, certain cases of placenta prævia, and genital atresia due to a newgrowth or cicatricial tissue may be considered as absolute indications for cesarean section. In the

cases of women suffering from medical conditions, including eclampsia and renal toxemia, the treatment should be conservative as a rule and operation should be undertaken only with full knowledge of its risks.

Of the cases reviewed, the operation was done for contracted pelvis and disproportion in 379 with a maternal mortality of 2.8 per cent (6 of the 9 women who died were frankly septic) for eclampsia in 44, with a mortality of 20 per cent (the 9 deaths due to such conditions as toxemia) for renal toxemia in 20, with mortality of 10 per cent (the deaths due to eclamptic toxemia) for placenta previa in 33,

with mortality of 9 per cent (the 1 death due to pulmonary embolism) for accidental hemorrhage in 24, with mortality of 21 per cent (3 of the 3 deaths due to hemorrhage and the result of anemia) for stenotic conditions in 4 with no mortality and for medical conditions such as mitral stenosis in 8, and cardiac failure, pulmonary tuberculosis, pneumonia and cardiac failure, multiple neuritis, and dementia praecox in 1 case each. In the cases of medical complications there were 3 maternal deaths—of cardiac failure and of pulmonary tuberculosis. Repeated sections for conditions other than contracted pelvis were done in 8 cases with no mortality. These cases included 5 of malpresentation, 3 of prolapse of the cord, 1 of hydrocephalus, 1 of infected fetus, 1 of repeated stillbirth, and 1 of abdominal hemorrhage. The only death in the cases of repeated cesarean sections

was that of the woman operated upon because of abdominal hemorrhage, who died from further hemorrhage due to an ineffective ligature.

A postmortem cesarean section was done in 6 cases. The cause of the death of the mother was eclampsia in 3 and tuberculous bronchopneumonia, chronic nephritis with cerebral hemorrhage, and rupture of the uterus in 1 case each. Two living children were delivered—one in the case of a woman with eclampsia and the other in the case of the woman who died of chronic nephritis.

There were 10 cases of ruptured uterus. In 4, the uterus was already ruptured when the woman was admitted to the hospital. In 4, the rupture followed a previous cesarean section. In the cases in which the uterus was already ruptured when the woman entered the hospital, hysterectomy as done in 2 of the women died on the operating table and 2 died later from infection. Of the cases of rupture following a previous cesarean section, hysterectomy was done in 3 and re-suture of the uterine scar in 1. In these cases there were no deaths. Of the remaining 4 cases in which the rupture occurred in the hospital, 1 was probably due to the medical induction of labor in 1. Hysterectomy as done in all 4 of the mothers died. The total mortality in the cases of uterine rupture was 5 per cent. The cases of survival were those in which no attempts at delivery had been made and the operation was performed soon after the occurrence of the rupture.

CHARLES BARNES, M.D.



# GENITO-URINARY SURGERY

## ADRENAL, KIDNEY, AND URETER

Kimbrough, J C The Surgical Treatment of Hydronephrosis *J Urol*, 1935, 33 97

The indications for surgical treatment in cases of hydronephrosis are as follows

1 Fibrous changes and infiltrations of the ureteral wall causing thickening and contraction with atresia of the lumen of the ureter

2 Perireteral fibrosis with angulation and constriction of the ureter Cases have been observed in which the ureteral sheath appeared to have become shortened, the ureter therefore having been forced to assume a tortuous course within it As the external appearance of the sheath in such cases may not be abnormal, this condition is often overlooked at operation

3 Anomalous vessels to the lower pole of the kidney causing angulation at the ureteropelvic junction or disturbing the peristaltic wave Quinby and others have noted that an anomalous artery located in proximity to the ureter but causing no mechanical obstruction may interfere with ureteral peristalsis and produce dilatation of the renal pelvis by its pulsation

4 Insertion of the ureter into the side of the pelvis to form a valve-like outlet which closes with intrapelvic pressure.

5 An anomalous position of the kidney causing angulation and obstruction of the upper portion of the ureter The most common cause is nephroptosis, and a less frequent cause, renal rotation If the upper part of the ureter becomes fixed by perireteral adhesions, a moderate renal excursion may produce obstruction Congenital anomalies causing obstruction are often bilateral but vary in degree so that the hydronephrosis may appear much earlier on one side

6 Neuromuscular dysfunction due to imbalance of the autonomic nerve supply of the kidney and ureter

The author emphasizes the importance of nephrostomy to sidetrack the urine from the site of operation Next in importance is splinting of the ureter by the introduction of a ureteral catheter from the nephrostomy wound To prevent angulation the kidney should be suspended Renal sympathectomy may be done

The ureteral splint should be removed after from four to six days The nephrostomy tube may be removed as early as the third week The patient should be kept in the Trendelenburg position for at least two weeks

The late postoperative treatment should consist of dilatations of the ureter

J SYDNEY RITTER, M D

Caporale, L The Dynamic Hydronephroses and Sympathectomy of the Ureter *J Urol*, 1935, 33 83

The author reports a study undertaken to determine the part played by the sympathetic nervous system in the development of hydronephrosis He interfered with the nerve supply of the ureter by the following procedures (1) removal of the nerve fibers in the serosa of the ureter, (2) denervation and the application of isophenol to the denervated area, and (3) denervation, phenolization, and the application of a cuff of cellophane around the ureter

He found that denervation was followed first by an increase in the ureteral contractions and then by gradual cessation of these contractions and a decrease in renal secretion From this study he concludes that segmentary sympathectomy of the ureter will produce, primarily, atony in the tract itself and secondarily, a gradual periureteral atony which culminates in progressive hydro ureteronephrosis He therefore believes his experiments support the dynamic theory of hydronephrosis which until very recently was based on hypotheses

In conclusion he says that his experiments emphasize the necessity for gentleness in the performance of uretero-ureterostomy and ureteroneostomy and in isolation of the ureter in gynecological operations  
J SYDNEY RITTER, M D

Gibson, T E Nephrectomy Versus Autonephrectomy in Renal Tuberculosis *J Urol*, 1935, 33 145

Autonephrectomy is commonly defined as a stricture of the ureter which completely closes the ureteral lumen so that no secretion reaches the bladder In other words, it is defined as a renal occlusion This definition is incorrect The term "autonephrectomy" should be applied only to cases of renal tuberculosis with both complete closure of the ureter and complete destruction and transformation of the kidney into a quiescent, shrunken, caseosclerotic mass which renders surgical nephrectomy unnecessary

Gibson reports two cases of unilateral renal tuberculosis which are examples not only of renal occlusion but also of true autonephrectomy as the destruction of the kidney by the disease process was such that the organ was not dangerous to the patient and its surgical removal was apparently not indicated One of the patients gave a history of thirty-five years' duration, yet enjoyed excellent health without surgical removal of the kidney In addition, this patient presented an unusual degree of calcification of the kidney and ureter

Approximately 0.5 per cent of tuberculous kidneys undergo complete calcification With quiescent

total calcification coincident with a normal condition of the bladder the prognosis appears to be equally good whether the patient is treated medically or surgically. This condition is an autonephrectomy in the true sense of the word because surgical nephrectomy is apparently not necessary.

Renal occlusion produces two general types of cases, one with tumor and the other with atrophy of the affected organ. Large occluded tuberculous pyonephroses resulting from secondary infections are not properly classified as autonephrectomies because they are definitely potential sources of danger to the patient and require surgical treatment. The diagnosis and treatment depend upon the findings of complete urological investigation. If a diagnosis of occluded renal tuberculous is made careful judgment must determine whether surgical treatment is indicated or not. If there is complete cessation of all symptoms with complete destruction and translocation of the kidney into a shrunken caseosclerotic mass which has removed itself from the sphere of danger to the patient, nephrectomy is not necessary.

In the problem of nephrectomy versus autonephrectomy the conclusion seems justified that in certain cases of unilateral renal tuberculous conforming to the definition of autonephrectomy suggested by the author, nephrectomy is not necessary or at least the risk of non-interference is no greater than the risk of nephrectomy.

C. T. ASHLEY, M.D.

### BLADDER, URETHRA, AND PENIS

Munro, D., and Hahn, J.: Tidal Drainage of the Urinary Bladder. A Preliminary Report of This Method of Treatment As Applied to "Cord Bladders," with Description of the Apparatus. *New England J. Med.* 1935. 72.

The apparatus for tidal drainage of the urinary bladder which is described by the authors literally fills the bladder to a predetermined height and then empties it by combination of siphonage and gravity flow. When evacuation is complete the siphon is interrupted. After being put into action the system works automatically. The authors recommend this type of drainage for all types of cord bladders. They classify cord bladders as (1) atonic cord bladders, (2) tonomic cord bladders, (3) hypertonic cord bladders, and (4) unobstructed reflex cord bladders.

THOMAS F. GRACE, M.D.

Mahler, G. E., and Vassilev, J. H.: Roentgen Diagnosis and Treatment of Tumors of the Bladder. *J. Am. M. Ass.* 1935. 94, 609.

The authors advise air cystography as an adjunct to cystoscopy in the diagnosis of bladder tumors. In this procedure the bladder is filled with air through a catheter placed in the point at which the patient experiences the sensation of full bladder. Anterior and posterior roentgenograms and in some instances oblique roentgenograms are then made. In none of the several hundred cases in which the authors have made a cystographic examination with air has air

embolism or emphysema of the pelvic tissues occurred.

By means of air cystograms tumors of the bladder ranging in size from 1 to 3 cm. can be demonstrated and their enlargement or reduction recorded photographically.

THOMAS F. GRACE, M.D.

Hinselmann, H.: What Does Leucoplakia of the Penis Teach Us? (Was lehrt uns die Penisleucoplakia?). *Zentralbl. f. Gynäk.* 1934, p. 992.

Leucoplakia of the penis, as observed first by Perrin later it as reported by Kraus, Geener, Nielsen, and others. Up to January 1931 about fifty cases were studied and recorded.

In a new case operated upon by Heller, Hinselmann has estimated the relation of leucoplakia of the penis to leucoplakia of the testis. He concluded that, like leucoplakia of the portio, leucoplakia of the penis is the starting point of carcinoma. This conclusion is supported by the facts that also (3 per cent) of fifty-one cases of leucoplakia of the penis reported in the literature showed carcinoma and carcinoma is found in 23 per cent of the matrix areas in the female genitalia.

Biopsies from an area of leucoplakia to establish the diagnosis of carcinoma are to be condemned since, as only fraction of section may show carcinoma, the probability of obtaining the carcinomatous tissue for microscopic examination by biopsy is practically nil and the possibility of making disastrous negative diagnosis of carcinoma is very great. Only complete excision of the leucoplakia is justifiable. Partial excision is both theoretically and actually dangerous because it may be followed by foliulating carcinomatous growth, as is case seen by Hinselmann. If a partially carcinomatous leucoplakia is not radically removed by operation, it will progress with bacillated certainty to carcinoma.

Whether it is in the portio or on the penis, like carcinomas of the portio having their origin in leucoplakia, carcinomas of the penis of similar origin require many years for their development.

Regression of a fully developed leucoplakia of the penis has not been observed by Hinselmann. A syphilitic leucoplakia of the portio, after years' regression, recurred at the same site several years later. Only the preleukoplakias, which are unique also microscopically may disappear under proper therapy. This is readily understood as they arise from the irritation produced by the preleukoplakia and disappear when the irritation is removed.

The matrix areas in the penis are also recognized more easily with the aid of the colposcope. In the case reported, the carcinoma appeared as a clump within the area of leucoplakia. This is never true in the portio. The chief differences between leucoplakia of the penis and leucoplakia of the portio are that the former causes subjective complaints and is amenable to radical surgical therapy, here the latter develops without symptoms and its treatment is functionally and psychologically of no aid.

(Schmitt) M. T. GRACE, M.D.

## GENITAL ORGANS

Achenbach, S. The Treatment of Varicocele (Zur Behandlung der Vancocoele) *Chirurg*, 1934, 6 747

The author rejects the theory frequently advanced that resection of the pampiniform plexus is the "normal procedure" in varicocele. The defects of the method are evident not only in the frequent immediate sequelæ (necrosis of the testicle and huge scrotal hæmatomata) but also in late complications (atrophy of the testicle and hydrocele).

On the basis of his own experience Achenbach recommends the less radical scrotal resection supplemented by a Bassini operation when an inguinal hernia is present. In all of his cases so treated the subjective symptoms were relieved almost completely.

Resection of the plexus is associated with a number of dangers. When the surgeon has been too radical the flow of venous blood from the testicle may not be sufficient. As the result of knotting of the venous stumps with one another the resected veins may become patent again. The internal spermatic artery, which is difficult to recognize and isolate, may be ligated accidentally. Moreover, it is usually impossible to avoid resection of the fine nerves leading to the testicle, which frequently results in subsequent atrophy of the organ.

In the recent literature the advice is frequently given to try conservative methods (cold baths and douches, the wearing of a suspensory) first, especially in cases with mild subjective symptoms and when there is a marked disproportion between the objective findings and the complaints of the patient (neurasthenics and sexual neurotics).

The author hesitates to recommend injection of the venous plexus with corrosive substances because of the danger of a marked perivascular reaction with injury to artery and nerve branches.

(W. POHLE) JOHN W. BRENNAN, M.D.

Cecil, A. B. The Extrusion Operation for Tuberculosis of the Epididymis. *J. Urol*, 1935, 33 160

In the technique described by the author the scrotum is cleaned and any tuberculous sinuses present are painted with pure carbolic acid. The scrotum is then seized and gentle pressure is made above the testicle. An elliptical incision is made through the skin around the sinus and while the pressure above the testicle is maintained with the hand, very light elliptical cuts are made concentrically close around the elliptical skin incision, bands of tissue being divided directly down to the tunica vaginalis. When the cuts are kept close to the central portion of skin a thick scrotal wall is maintained, opening of abscesses is avoided as any abscesses can be seen, and the tissues can be cut lightly further out. As the cuts are made, the testicle and epididymis become extruded from the scrotum and all bleeding points can be seen and ligated. Ligation of bleeding points is important to insure a dry scrotal bed to which to return the testicle.

In this manner the testicle is extruded through the wound rather than delivered as is done when the so-called high incision is made, and trauma is avoided. The scrotum, which has not been in any way contaminated, is immediately wrapped with salt packs, covered with a towel, and kept surgically clean. The placing of packs under the testicle completes the preparation for epididymectomy. The tunica vaginalis is then opened and the epididymis separated from the testicle. The epididymis and testicle are both wrapped in warm salt packs and set aside. A clamp is pushed up along the vas until it reaches the external ring. A small nick is then made over the tip of this clamp and another clamp is pushed down along the same path. The latter is used to clamp off the vas. The vas is cut between two clamps and thoroughly carbolized. The clamp and vas are then drawn upward to bring the vas out in the groin. At no time is the clamp removed from the vas. Ligation of the vas is not attempted.

A single stitch is passed through the nick and the suture then lightly tied about the vas. The clamp with the vas still fastened in it is wrapped in gauze and strapped to the abdomen. The scrotum is pulled down over the testicle and closed by interrupted dermal sutures. A dry dressing is applied without collodion. The scrotum is supported with a binder.

After seven or eight days the vas comes away at the level of the skin in much the same manner as the umbilical cord shrivels and dies. In cases in which the vas has seemed to keep up its blood supply a ligature has been lightly tied around it at the skin level to cause it to slough.

The advantages of this operation over the so-called high incision procedure are summarized as follows:

- 1 Soiling of the scrotal bed is avoided at all times.
- 2 The extrusion of the testicle through the scrotum with the sinus formation attached renders multiple incisions unnecessary.
- 3 Trauma is avoided.
- 4 The entire thickness of the scrotum is preserved.
- 5 Bleeding points can be seen and taken up as concentric cuts are made.
- 6 Soiling of the wound by the vas is prevented.
- 7 The wound heals by primary intention in a large majority of the cases.

C. TRAVERS STEPITA, M.D.

## MISCELLANEOUS

Hansen, J. Experiences and End-Results in Injuries of the Urinary Passages (Erfahrungen und Ergebnisse bei Verletzungen der Harnwege). *Ergebn. d. Chir*, 1934, 27 470

The author reports on 17 cases of bladder injury, 60 cases of kidney injury, and 135 cases of injury of the urethra.

Of the cases of bladder injury, 70 per cent were fatal. The high mortality was due chiefly to the severity of the injuries, most of which were complicated by fractures of the pelvis and severe hæmor-

phages occurring in the pelvic connective tissue and extending far into the retroperitoneal tissue. In such cases the danger of phlegmonous urine infiltration is very great. It is therefore unwise to be satisfied with the introduction of a retention catheter even if at first it seems sufficient. The treatment of choice is suprapubic cystostomy. Hansen believes that in its execution the introduction of a urethral catheter is injurious. After the tear in the bladder has been closed, suprapubic drainage with a very large rubber tube is sufficient. The treatment of so called intraperitoneal rupture of the bladder—in which laparotomy is necessary and, if possible, extraperitonealization of the site of the tear is done by Miklebrandt's technique—is the same. Hansen discusses the literature on the occurrence and signs of rupture of the bladder. As in all of his cases the rupture occurred in association with fractures of the pelvis, the injuries are not tears but punctures. Traumatic rupture of the bladder is not very common. The cause of death after rupture is hemorrhage, sepsis, or uremia, not peritonitis.

Of the 60 reviewed cases of kidney injury 47 are treated expectantly with a mortality of 8 per cent and 13 are treated surgically with a mortality of 50 per cent. In discussing the causation of rupture of the kidney Hansen teaches some importance to Kuester's theory of adduction movements of the lower ribs and direct crushing or bursting of the organ. However he rejects Kuester's theory that hydraulic pressure is the cause of the rupture. For diagnosis and determination of the operative indication the author advises excretion urography as the nature and duration of the hemorrhage does not permit definite conclusions as to the severity of the injury. In only 7.5 per cent of the reviewed cases was stone formation found after the kidney injury. Traumatic hydronephrosis was observed in only 1 per cent. The occurrence of traumatic floating kidney is disputed. Tuberculosis and tumor of the kidney never occur as the consequence of accidental injury to the organ. However all later examinations reveal some degree of pyelonephritis. The operative treatment of choice is nephrectomy, which alone seems to give good result.

In the 35 cases of urethral injury reviewed the total mortality was 29 per cent, but if the hopeless cases are excluded, it was only 14 per cent. The postoperative mortality was 43 per cent, but if the hopeless cases are excluded it was only 26 per cent. In all cases in which a residual catheter was employed, whether they were treated surgically or expectantly, evidences of infection appeared after a few days. These ranged from mild phenomena to the most severe urinary phlegmons and abscesses and were attributable undoubtedly to the residual catheter. In all but about 10 per cent of the cases this infection caused later complications of much more importance than strictures and fistulae—usually pyelonephritic conditions in both kidneys, contracted kidneys, and enormous stone formations. The author therefore opposes the use of the residual catheter in any form. For the milder cases of incomplete rupture of the urethra he advocates expectant treatment and for all others immediate suprapubic cystostomy and later suture of the urethra. About the introduction of a catheter from the perineum in the cases reviewed the incidence of anatomical healing was low—under 10 per cent. Cholel cure was obtained in 26 per cent of 43 cases treated expectantly, 37 per cent of 4 treated by suprapubic section, and 35 per cent of 4 treated by low section. The incidence of healing obtained by all methods was approximately 30 per cent.

(LAWSON) LEO A. JEWELL, M.D.

Howard, M. E., and Strauss, M. J. Lymphogranuloma inguinale. A Report of Sixteen Cases in and Around New Haven. *The English J Med* 1935, 313.

Of the sixteen patients whose cases are reported by the authors, eleven were males. In all of the cases there was positive reaction to Fries antigen. In all of the females the condition was associated with structure of the rectum. The cases of long standing T of males were observed before suppurative of the inguinal glands had taken place. Repeated intradermal or intra-mucous injections of Fries' antigen caused discharging abscesses to heal.

THEODORE F. GAUTIER, M.D.

# SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

## CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC

Maxwell, J. P. Further Studies in Adult Rickets (Osteomalacia) and Fetal Rickets *Proc Roy Soc Med*, Lond, 1935, 28, 205

Maxwell discusses rickets from the standpoint of the obstetrician. He first describes a pelvis severely deformed by osteomalacia which was obtained from Shansi, China, and is now in the museum of the Royal College of Surgeons. This pelvis is so contracted anteriorly that the acetabula open almost forward. The height of the pelvis is almost exactly half the width. The anterior part of the outlet is V-shaped instead of the normal wide oval, and the edges are rough and jagged. The width from the outer edge of one ischial tuberosity to the other is a little less than two-fifths of the width from one iliac crest to the other.

The specimen was obtained at autopsy from the body of a woman thirty-nine years of age who died following a caesarean operation. The generalized skeletal deformity, especially an overlapping of the ribs on the ilium on one side, rendered delivery very difficult. The lumbar spine was ankylosed between the transverse and spinous processes.

Next described is the extremely deformed and asymmetrical pelvis of a woman of forty-three years who died after delivery of a dead fetus at term by caesarean section. The baby had fetal rickets. The mother gave a history of osteomalacia with pain in the back and legs, diminution of height, and tetany. The ends of all of the long bones and the ribs showed irregularities and imperfections of ossification. The vertebrae showed bulging of the intervertebral disks into the osteoporotic bodies, which is characteristic.

The author reports the case of a woman twenty-nine years old in whom osteomalacia developed rather rapidly after a normal delivery. The blood calcium was 7.3 mgm and the blood phosphorus 4.0 mgm. per 100 c cm. The calcium content of the patient's milk was low 17.7 mgm. Two months after delivery the pelvis was so deformed that another normal delivery would have been impossible.

The author holds that osteomalacia and rickets are very closely related, if not the same disease in different periods of life. It has been stated that in India all babies born of osteomalacic mothers tend to develop rickets and some of them develop tetany. The author cites three Chinese women who had both the bow legs or knock knees of rickets and the deformed pelvis of osteomalacia. While pain in the legs and back is a common symptom of osteomalacia, rickets is never a painful disease.

Sixteen cases of fetal rickets are reported in tabular form. In fourteen, the mother had osteomalacia.

The occurrence of fetal rickets should be suspected if the mother's blood calcium is low or if the product of the blood calcium times the blood phosphorus is under 20. Evidence of rickets has been found by microscopic examination of fetal bones when roentgen examination showed no signs of it. The bones in fetal rickets show lower figures for dry weight, weight of ash, calcium content, and phosphorus content. In one case the early diagnosis of fetal rickets was confirmed by defects in the development of the enamel of the teeth when they came through.

Calcium-phosphorus metabolism and physiological chemistry in general are discussed.

WILLIAM ARTHUR CLARK, M.D.

Vastine, J. H., and Bacon, E. P. Osteitis Tuberculosa Multiplex Cystica, with a Report of Two Cases. *Radiology*, 1935, 24, 22.

The type of bone tuberculosis discussed by the authors was probably first described by Krebisch in 1904, but was first called "osteitis tuberculosa multiplex cystica" by Juengling in 1920. It occurs in the shafts of long bones, including the phalanges. Unlike the metaphyseal form of tuberculosis, it forms multiple lesions. It probably has its origin in tuberculous lymph nodes in the chest and is disseminated through the blood stream. The result of each lesion is a cyst. The cortex is thin and sometimes expanded. As pain is absent and there may be no swelling over the affected bone, the disease is often unrecognized. It is probably present in many cases of infantile tuberculosis. There are records of cases in which the cortex broke down, an abscess appeared in the soft tissues, and a sinus was formed through the skin.

Fever occurs only when a secondary infection has developed. Anæmia, leucopænia, and lymphocytosis constitute the usual blood picture. The normal chemical character of the blood differentiates this tuberculous cyst condition from osteitis fibrosa cystica. The diagnosis is made by roentgen examination. A positive tuberculin and a negative Wassermann reaction are important findings.

The authors report two cases. The first was that of a male infant seventeen months old who had had lumps on the fingers, wrists, ankles, and feet since he was six months old. The skin over the swellings had ulcerated. The child was under normal weight. Examination disclosed infected tonsils, moderate rickets, and multiple hard and painless swellings on the feet, hands, forehead, forearms, and ankles. The blood count showed anæmia. The blood calcium was 7 mgm. per 100 c cm of serum. Urinalysis was negative. Biopsy on a fragment of the fibula showed typical tubercles in the granulation tissue, areas of necrosis, active bone proliferation near the granula-

toes, and no typical bone marrow. During the six weeks the child was in the hospital his general condition improved. Thirteen weeks later the bony swellings on the forehead had disappeared and those on the hands were smaller.

The authors' second case was that of a boy two years old who had hard, painless swellings on the back of the hand and at the angle of the jaw and was suffering from tuberculous bronchopneumonia and otitis media. Examination of the blood showed anemia. The blood calcium was 8 mgm. per 100 c.c.m. The Wassermann test was negative, but the tuberculin test was positive. Urinalysis was negative. During the four weeks the patient was in the hospital there was no improvement in the bone lesions, but the tuberculous bronchopneumonia and otitis media were relieved.

In such cases the roentgenogram shows rarefaction originating in the marrow and producing a spotty appearance. The lesion may spread diffusely or remain circumscribed. In the phalanges multiple lesions are the rule. In the diffuse type the cortex and medulla cannot be differentiated. The bone is usually increased in diameter and may show sclerosis. The bone atrophy which is so characteristic of the common form of joint tuberculosis is not prominent. In the circumscribed type the lesions have a punched-out appearance and the very thin cortex is either expanded, destroyed. This is said to represent a healing stage. In the authors' first case, an example of the circumscribed type, the lesion remained stationary for several years. In the right tibia and fibula several stages of cystic tuberculosis could be found: the diffuse type, the sharp circumscribed type, the quiescent type, and a rupture through the cortex with sinus formation. In the second case roentgen examination showed areas of decreased density in the jaw and similar and sharply punched-out areas in the bones of the hand. Fifty-six months later these areas had disappeared in the jaw and had practically disappeared in the hand.

WILLIAM ARTHUR CLARK, M.D.

Van der Linden, P.: Paravertebral Injections of Novocain in the Management of Sprains and Traumatic Arthritis (Paravertebrale Novocaininjectionen als Behandlung der Verstaechungen und traumatischen Arthritiden). *Zeitschr. f. orthop. Chir.* 93:4, 61, 1924.

According to Leriche, the afferent nerve fibers and the sensory bodies in the joint tendons are of great importance in joint conditions as, through them, sprains may give rise to long or short reflexes which influence the muscles, bones, and synovial membranes of the affected joint by way of the sympathetic. Leriche found that by the paravascular injection of local anesthetic, it was possible temporarily to overcome the limitation of movement and the pain in the joint except in cases with gross anatomical injuries to the joint surfaces. The beneficial effect lasted much longer than the usual local anesthetic. The freedom from pain lasted for hours and often

even for days. When the pain returned, the injection was repeated. Cure resulted after from four to six injections.

At the Grange-Blanche Hospital, Lyons, this treatment has been employed over a period of years as the procedure of choice for all cases of sprain and traumatic arthritis. It is begun as soon as fracture or other severe anatomical injury has been ruled out.

After disinfection of the skin a 1 per cent solution of novocain without adrenalin is injected in the region of the articular ligaments, particularly at the sites which are painful on palpation. The maximum amount of the solution injected is between 30 and 40 c.c.m. When the pain recurs the injection is repeated.

The author reports a number of cases showing the value of this treatment.

(Trans.) JACOB C. KLEIN, M.D.

Paulsen, D.: Research on the Myopathies (Recherches sur les myopathies). *Presse med.*, Paris 93:4, 42, 1924.

The following five clinical types of myopathy have been described in the literature: (1) pseudo-hypertrophic paralysis, (2) the Leyden-Bioehlin type, (3) the juvenile type or scapulohumeral type of Erb, (4) the fascioscapulohumeral type (Landouzy-Djerine) and (5) the Zimmern type.

Fourteen cases have been studied by the author. In seven, the condition began before the age of fifteen years. In almost all there are trophic disorders, contractions, and vasomotor disturbances. A relation of inheritance to the onset could not be established definitely. Only three patients gave a family history of similar conditions and in only two cases did trauma seem to be related to the onset.

The author describes the changes found in the brain and cord by Felix and Ninkovic and the results of studies of muscle fibers obtained by biopsy from four cases of pseudohypertrophic muscular dystrophy. The latter have been reported previously by the author in collaboration with Scriba.

Paulsen believes that, in general, the myopathies are due to defects of intra-uterine development and can be explained best on an embryological basis.

MARSH W. POOLE, M.D.

Charnet, G.: Painful Conditions of the Scapulo-humeral Region and Their Treatment With Physical Agents (Les signes scapulo-humeraux de leur traitement par les agents physiques). *Presse med.* Paris 93:4, 4, 1924.

Charnet describes a clinical syndrome characterized usually by persistent pain in the shoulder, its moderate limitation of the most extent of the shoulder joint, atrophy of the deltoid muscle, and tenderness on pressure over certain points. In some cases there may be pain radiating down the arm and atrophy of muscles other than the deltoid with more marked functional disability of the shoulder joint. This syndrome has been given the name "scapulohumeral periarthritis."

Abduction of the arm is not difficult in the beginning, but becomes more limited until the arm cannot be raised above the horizontal. The limitation is due to involvement of the subacromial bursa, the tendon of the supraspinatus, and the head of the biceps.

Tenderness is found over the tip of the acromion and in front of the shoulder over the head of the humerus. Roentgen examination is very useful in differentiating this condition from conditions causing cervicobrachial neuralgia and from injuries of the shoulder. It may reveal osteoporotic changes in the scapula or humerus or calcification in the soft tissues in the subacromial bursa or along the tendons of the supraspinatus or biceps.

Of the physical agents used, deep heat obtained by diathermy or infrared irradiation is beneficial, but the author finds roentgen irradiation most effective. He administers a moderate dose two or three times weekly, anteroposteriorly and from the lateral position. Relief becomes apparent after from a week to a month and complete cure is the rule. The calcium deposits gradually disappear. Chaumet almost always supplements the roentgen treatment by infrared irradiation.

MILTON W. POOLE, M.D.

Sejlar, J. The Tennis Arm: Its Cause and Treatment (Tennis arm—Läsche, Behandlung). *Arch. f. Orthop. u. Grenzgeb. Chir.*, 1934, 13, 104.

Thirty per cent of joint injuries due to sports involve the region of the elbow joint. The clinical picture of the so-called "tennis arm" is characterized by pain in the region of the lateral epicondyle. Therefore some orthopedists have attributed the condition to a so-called epicondylitis. Others have denied the occurrence of epicondylitis. At first, the pain occurs only during strenuous use of the arm. Later it may gradually become more severe and radiate along the radial side of the forearm to the fingers and into the upper arm. It is then associated with very troublesome weakening of the muscular power of the arm, and eventually it is present even when the arm is at rest.

The objective findings, especially in the chronic forms, frequently show no abnormalities. The mobility of the joint is not limited, and in the majority of cases roentgen examination fails to reveal any change which will explain the severe pain. Even in chronic cases a positive roentgen finding is exceptional. Possible causes of the condition are:

1. An injury of the muscular and tendinous soft parts, especially the extensors and supinators of the hand (intramuscular hemorrhages, the deposition of calcium salts, and possibly even new bone formation), tears of the muscle insertions (particularly of the brachioradialis muscle and the extensor carpi radialis longior), and injury of the fascia and the perimyosium.

2. A true periostitis of the external epicondyle of the humerus.

3. Bursitis. The bursa in question is not always present and its bilateral occurrence is especially infrequent. It lies under the insertion of the extensor

musculature in the region of the epicondyle and normally measures 1 by 0.5 cm. In the presence of the inflammation it varies in size and in its relationship to the surrounding structures. When the deposition of calcium occurs the roentgen picture may be confused with that of periostitis of the epicondyle. Carp attributed tennis arm in five men and three women to such a bursitis.

4. Neuralgia or neuritis (radial and lateral antebrachial cutaneous nerves).

5. Changes in the joint capsule, especially chronic inflammation, on the volar side of the collateral radial ligament.

6. Subluxation of the head of the radius with possibly pinching of the stretched joint capsule in the joint space.

7. Injuries and strangulations of the annular radial ligament (Mills). According to the statistics of Knoll, true severe articular changes were not found in forty-five German tennis players who were subjected to repeated examinations. Another investigator was able to find a severe arthritis deformans of the head of the radius in the case of only one tennis player. A circumscribed so-called periarthritis humeroradialis is probably very seldom the cause of the pain.

Just as varied as the etiological factors of the condition are the methods of treatment. The procedure of choice consists in directing the patient to avoid every activity causing the pain and immobilizing the elbow joint at a right angle for from three to four weeks by a removable rectangular splint applied on the iliac surface. The particularly painful spots should be well padded. According to Carp, bursitis is best treated by causing the bursa to burst by increased pressure under general anesthesia. If this is not successful the bursa should be removed by operation.

9. As surgical treatment, Hohmann recommends, for chronic cases, separation of the fibers of the extensor carpi radialis from their bony insertion on the epicondyle. He claims that this procedure has a favorable effect on the periosteal irritation. However, it may fail and in some cases may even cause the condition to become worse. Other surgeons recommend chiseling off the entire epicondyle.

(ISIGLER) HARRY A. SALZMAN, M.D.

Kadrnka, S., and Mach, R. Hygromata of the Epicondylar and Bicipital Bursae Containing Rice Bodies. A Contribution to the Clinical and Roentgen Study of Chronic Bursitis (Hygromas à grains riziformes des bourses épicondyenne et bicipitale. Contribution à l'étude clinique et radiologique des bursites chroniques). *Rev. d'orthop.*, 1935, 22, 26.

The case reported was that of a man forty-one years old who, at the age of sixteen years, sustained an injury to both elbows with resulting atrophy of the forearms for which he was exempted from military service. Five months before his admission to the hospital he had fallen and struck on his left

elbow. A large swelling believed to be a hemistoma developed around the joint. When the patient was admitted to the hospital the elbow presented large fusiform swelling and was held in position of slight flexion and pronation. Extension and rotation were limited.

The roentgenogram showed two affections: luxation of the elbow due to a pathological fracture complicating old tuberculous and double buritis of the bicipital and epicondylar bursa. The rice bodies in the hygromata were distinctly visible. The roentgen diagnosis was confirmed by the findings at autopsy.

Buritis of the bicipital and epicondylar bursae is rare. In the case reported it was evidently brought about by the mechanical conditions in the injured elbow. This case shows that rice-body hygromata are not necessarily tuberculous. Although there was an old tuberculous of the elbow histological examination showed no evidence of tuberculous in the bursa and the buritis was evidently of traumatic origin. The diagnosis is difficult in such cases, particularly as the clinical signs are masked by lesion of the joint (pathological fracture and luxation with ankylosis). In the case reported the clinical signs suggested tuberculous in cold abscess. The diagnosis was made only by roentgen examination.

fact showing the importance of such an examination in chronic buritis. The roentgen picture of rice body buritis is cystic para-articular shadow.

ARMORY GOSSET MORGAN, M.D.

Fèvre, M.: The Pathogenesis of Painful Pronation in Young Children; Catching of the Bicipital Tuberosity on the Posterior Crest of the Sub-sigmoid Cavity of the Ulna (Pathogénie de la pronation douloureuse des jeunes enfants: l'accrochage de la tubérosité bicipitale à la crête postérieure de la cavité sous-sigmoïdienne du cubitus).

*Rev. d'orthop.* 1935 43 5.

The author reports experiments on the cadaver which show that painful pronation in children is caused by impingement of the bicipital tuberosity on the posterior crest of the lesser sigmoid cavity of the ulna. He shows the mechanism of the action by diagrams. The normal oval head of the radius cannot pass back of the crest of the cavity. When the head is circular it slips back and is caught so that normal supination is rendered impossible. Painful pronation occurs when a child is pulled along by the arm by the mother. A movement of traction and abduction is produced. The child feels pain and the arm remains in pronation. It can be reduced by movement of supination followed by flexion. This is accompanied by cracking sound. The sound was heard in the experiments on the cadaver when the rounded head of the radius was reduced to its normal position. The author therefore believes that painful pronation is due primarily to a congenital malformation of the bone and its pathogenesis is similar to that of certain recurrent luxations of the shoulder or patella.

ARMORY GOSSET MORGAN, M.D.

Almoe, A., and Pares, L.: Condensation of the Semilunar Bone (Condensation du semi-lunaire). *Rev. d'orthop.* 1934 41 506.

A man twenty-six years of age who had had no previous injury to his hand or wrist sustained a wound of the right index finger which became infected. About three weeks later an abscess developed on the back of the right wrist, but did not drain. A few days later the entire wrist was swollen and painful and required immobilization. Two months after the original infection roentgenogram showed extreme rarefaction of all the carpal bones except the semilunar bone. The semilunar bone as dense as normal and its contour was indefinite.

The wrist and finger became almost stiff but later the stiffness as reduced by physical therapy. Pain and tenderness persisted for about five months. The last roentgenogram showed the semilunar bone still very opaque and irregular in outline.

This case demonstrates definitely that condensation of the semilunar bone which has at any time been attributed to trauma may be of infectious origin.

WILLIAM ARTHUR CLARK, M.D.

Jansen, M.: Notes on Scoliosis and Round Shoulders; Their Causes and Their Treatment (Remarques notes sur la scoliose et la dos rond: leur causes et leur traitement). *Rev. d'orthop.* 1934 41 565.

As prophylaxis against scoliosis, a child should not be allowed to sit up before it is old enough to sit. The pillars of the diaphragm are attached to the lower thoracic spine in such a manner that with each inspiration there is more pull from the left than from the right. The pull from the left therefore has a tendency to produce a left thoracolumbar curve. At the same time, the left lung, having a greater expansion than the right, pushes against the mid thoracic spine and tends to cause a right thoracic scoliosis. A child sitting in its crib will almost have its knees extended, position causing the spine to assume a long kyphosis which may become more or less fixed as the vertebrae become harder.

It has been customary to speak of primary and compensatory curves, but the author holds that three curves may develop simultaneously before the child begins to walk and therefore before the necessity for compensation to preserve body balance arises. An infant often sits in an inclined position, for example, in the mother's arm, with the pelvis tilted and the lumbar spine making a lateral curve. In addition, it may sit up its neck while nursing, thus causing a high thoracic and cervical curve.

A child may be kept from sitting up by strapping a cross behind the buttocks with the long arm of the cross extending toward the feet.

Treatment should be begun as early as possible. It is estimated that in the case of a patient sixteen years of age the difficulties of correction are five times as great as in a child of two years and sixteen times as great as in a baby of one year. Massage and exercises are useless chiefly because they are continued for only an hour or so. In the author's pre-



cedure the treatment is continuous, day and night. The corrective force is applied to one curve only, and the curve is over corrected. In the cases of older patients, in whom the curve cannot be reversed, the aim is to shorten the curve. During the day the patient wears a rather simple brace anchored to the pelvis by a band. A wide pressure pad pushes against the thoracic curve and a narrow leather band around the neck holds the brace tight against the curve. At night, a corrective plaster bed is used.

Scoliosis in adults and very severe scoliosis in children, including paralytics, are not treated by this method. They require operative fusion of the spine.

The good results obtained in three cases are shown by illustrations. A similar brace may be used for kyphosis.

WILLIAM ARTHUR CLARK, M.D.

Linde, F. Can the Old View of the Constantly Accidental Origin of Rupture of the Interarticular Ligaments of the Knee Be Saved? (Kann die alte Anschauung von der stets unfallweisen Entstehung des Kniebandscheitnisses gerettet werden?) *Med. Klin.*, 1934, 2: 1556.

On the basis of his experiences in the treatment of more than 400 meniscal injuries the author discusses critically the theory often advanced recently that many ruptures of the meniscus are spontaneous ruptures due to attrition. Because of this theory a relationship of injury is recognized only when there is a history of a severe external force causing hemorrhage into the joint and disability. The author states that rupture of the meniscus is almost never the result of the direct action of severe external force. As a rule it follows a mild accident such as slipping, a misstep, or stumbling. Frequently it occurs in rising from a squatting position or after prolonged kneeling or sitting with the legs crossed or other changes from such positions. With flexion of the knee and turning of the leg outward the meniscus changes its position and thereby becomes engaged more easily in the "pinchers of the tuberosity." In this process reflex and involuntary muscle contractions play an important rôle. These statements apply also to rupture of the meniscus in skiers.

In the cases of miners, injuries of the meniscus are usually limited to the interarticular portion because as a rule there is no bodily swing, whereas in injuries due to sports, extension of the rupture to the capsule and associated injury of the crucial ligaments are common because of the swing of the body. This explains why effusion of blood into the knee joint occurs more frequently in injuries due to the sports than in injuries sustained by miners. With few exceptions, miners present the "meniscus bipartitus."

Microscopic examinations of removed menisci made by Husten showed that in 75 per cent of the cases the microscopic changes varied directly with the length of time that had elapsed between the accident and the operation. On the basis of the

microscopic findings it seemed justifiable to conclude that in all of the cases the changes observed had occurred after the rupture. Apparently they depended upon the severity of the nutritional disturbance caused by the injury. As the result of disregarding the physiological anabolic and catabolic processes occurring constantly in the interarticular portion of the meniscus as well as in all other living tissue, it has been erroneously concluded that the catabolic changes found in the interarticular portion of the meniscus are evidences of pathological erosion.

The relation of the microscopic findings to the length of time elapsing between the injury blamed and the operation is shown by the author by a table. The majority of the cases without microscopically demonstrable pathological changes or with only slight changes were early cases. In most of the cases with moderate changes the injury had occurred about four months previously, and in those with marked changes it had occurred six months or more previously. In the early cases the microscopic changes were found chiefly at the edges of the tear. The older the case the more frequently were changes demonstrable within the torn meniscus. The theory of spontaneous tearing is refuted also by the fact that rupture of the meniscus is never found in knee conditions of other types in which the meniscus is involved. In the cases of a number of miners who for years had worked in the kneeling position for days at a time no catabolic changes were found in the meniscus removed for rupture. Neither were such changes found in the meniscus removed for rupture in numerous cases in which erosion could not have been produced by the patient's occupation. In such cases only a mild injury such as slipping came up for consideration.

The decision of the Government Insurance Department that, to prove a relationship between rupture of the meniscus and an accident, visible evidences of the accident blamed are necessary, and the refusal of that department to recognize such a relationship in a case in which the condition was attributed to an ordinary movement (rising from a kneeling position), the author believes is incorrect.

(KONJETZNY) LOUIS NEUWELT, M.D.

## SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Schwartz, A. Results of Tendon Suture in the Hand (Die Erfolge der Sehnennahte an der Hand) 1934. Basel, Dissertation.

The author reviews 390 cases in which tendon suture was done in the Surgical Clinic of the University of Basel in the period from 1922 to 1932, exclusive of cases with major complications such as fractures, luxations, and injuries of large vessels and nerves. Two hundred and seventy-three (60 per cent) of the injuries involved extensors and 117 (30 per cent) involved flexors. Of the injuries of extensors, 104 (61.4 per cent) were cured completely

and 34 (97 per cent) were cured incompletely. Of the injuries of flexors, 46 (4 per cent) were cured completely and 30 (76 per cent) were cured incompletely. In 60 cases of extensor injury and 55 of flexor injury the cause of poor results could be ascertained. In 35 (58.3 per cent) of the former and 48 (87.4 per cent) of the latter the failure was due to adhesions in 5 (5 per cent) of the former and 4 (7.4 per cent) of the latter to infection in 7 (16 per cent) of the former and 3 (8 per cent) of the latter to later suppurative processes and in 5 (5 per cent) of the former and 1 (8 per cent) of the latter to cutting through of the sutures.

Of considerable importance is the location of the injury. The nearer the injury to the end phalanx the poorer the prognosis. This is true also of opening of the joints. The prognosis is best in injuries of the dorsal surface of the hand, apparently because of the mobility of the skin in this part.

The age of the patient is also a factor as the best results are obtained in the cases of patients between twelve and twenty years of age. In the younger patients the poorer results are due to insufficient immobilization, and in the older patients to continued regression of the vascular supply. The period of immobilization is indefinite, depending on the patient's age, whether the wound is infected or not, and other factors. The poorer healing tendency of the flexors may be explained on several grounds. Because of their position, these tendons are exposed to greater mechanical irritation, as the result of which, according to Srdenski, the tendon cells produce an intercellular substance and surround themselves with a capsule, thereby coming to resemble cartilage cells. Consequently in case of injury a premature and inferior callus is formed. The effects of pressure from the paratenon and endotenon—from fibrocytic elements of which, according to Gersz, Gerlach, and Gassel, the regeneration arises—hinders the regeneration. Other factors are the ease with which infection spreads through tendon sheaths and the impossibility of disinfecting flexor tendons which are situated deep in the tissues.

The article is concluded by brief discussion of therapy. In the author's cases the wound is treated according to the classical principles of freshening and disinfection. Chronic catgut is the best material for tendon suture. The use of ligatures should be as limited as possible. Occasionally gut sutures may be used. The tendon sheath should not be sutured. The author injects balsam of Peru into the cavity of the tendon sheath and treats the surrounding tissues with 3,000 solution of iodoform. When the skin has been sutured without tension he injects staphylococci under it in the direction of the tendon suture. If then immobilizes the part in plaster-of-Paris dressing. If tendon injuries which are more than six hours old the wound is not sutured, but is freshened and packed with cod liver oil vasoline and the part immobilized in plaster-of-Paris splint.

(WALTER GRUBB) JOHN W. BRENAN, M.D.

Saunders, J. T.: The Etiology and Treatment of Clawfoot: Report of the Results in 102 Feet Treated by Anterior Tarsal Resection. *Arch. Surg.* 1935, 30, 70.

Claw foot is described by the author as a structural deformity usually developing during adolescence with no apparent relation to sex, race, or social status. The typical clawfoot is characterized by exaggeration of the height of the longitudinal arch, shortening of the foot, prominence of the metatarsal heads, clawing of the toes, loss of flexibility of the joints, and reduction of the treading surface.

When the condition is mild it is usually first discovered when difficulty is experienced in finding comfortable shoes for the child. Tender areas on the dorsum of the foot, easy fatigue, weakness of the ankles, and a backwardness of the gait are frequently noticed. When the deformity is more marked, callouses appear, usually under the first and fifth metatarsal heads or as corns on knuckles of hammer toes. These cause great discomfort and, in extreme cases, ulceration.

The author discusses the various theories regarding the cause of claw foot. By some, the condition has been believed to be of congenital origin. By others, it has been attributed to acute illnesses of childhood, constriction of the feet during growth, muscular imbalance, paralysis following poliomyelitis, disease of the central nervous system, heredity, trauma, or infection. Saunders states that most of the known causes are lesions of the central nervous system such as synergistic occur after poliomyelitis and disturb the synergistic control of muscular tone.

Relief may be given in nearly every case by proper treatment. The author presents an outline of treatment based on the degree of the deformity.

In the slight cases, special shoes and exercises are usually sufficient. With moderate to severe, lengthening of the calcaneus tendon, transplantation of the long toe extensor tendons to the cuneiform bones and arthrodesis of the interphalangeal joint of the first toe are necessary. For marked or severe cases, anterior tarsal resection, frequently supplemented by the measures described, is advocated. The author reviews the results obtained in 102 feet by this method. After minimal follow-up period of two years the results were excellent in 8, good in 31, fair in 41 and poor in 14.

Subtalar arthrodesis is recommended if a correction of more than 40 degrees is necessary or if there is a marked calcaneal position of the heel with lateral instability. ROBERT S. RICE, M.D.

#### FRACTURES AND DISLOCATIONS

Meneguzzi, G. and Odlette, D. The Influence of Certain Metals on the Fixation of the Mineral Components in Cultures of Osteoblasts (Influence de quelques métaux sur la fixation des composants minéraux dans les cultures d'ostéoblastes). *Presse med. Par.* 1935, 43, 5.

The phenomena occurring in the healing of fractures include cellular proliferation, the formation of

an intercellular substance and infiltration of the intercellular substance by certain mineral components. The authors have published the results of their experiments on the effect of various metals on the rate of proliferation. In the studies reported in this article with regard to the rate of cellular proliferation of the mineral component, the results established the total amount of mineral in the culture was determined by the chemical method of color reaction. The technique of the tissue culture has been previously described. Cells of chick embryo from five to sixteen days old were used in chicken plasma with or without extract of the hypophysectomized. After five to eight hours of normal growth the cultures were placed on a glass surface having a pattern the characteristic of an embryo to appear. Discs of various sizes and diameters were added to the culture. In each mineral culture a few control controls were made. After two months growth the cultures are washed and the results examined microscopically on a black background with transmitted light. The following observations are drawn:

1. None of the simple metals can be used in a tissue culture without their inhibition, magnesium, sodium or calcium. The growth of osteoblasts and of the calcareous ions inhibit fixation of the mineral components.

2. No alloy of aluminum can be recommended as all such alloys except one are toxic or lethal to the bone cells and the one with no toxic action (aluminum) inhibits fixation of the mineral.

3. Most of the rustless steels have a harmful action on the cellular growth and mineral fixation.

4. Only three varieties of steel, A2, A1, and A3, and the Platinum-Iridium seem to be inert. Therefore these three are the only ones which could be used for the internal fixation of fractures.

BARBARA B. STILES, M.D.

Houang, K. The Role of the Nutrient Arteries of the Long Bones in the Formation of Callus and the Calcification of the Medullary Cavity. Le rôle des artères nourricières des os longs dans la formation du cal et la calcification de la cavité médullaire. *Presse Méd. Far.* 1934 4: 973.

In experiments which the author carried out on rabbits to ascertain the role of the nutrient arteries in callus formation a defect was made in both femora and the nutrient artery was cut on one side only. Roentgenographic and histological studies were then made at weekly intervals up to the eleventh week.

It was found that callus formation proceeded equally on the two sides but the medullary canal showed evidence of greater calcification on the side on which the nutrient artery was sectioned.

The author concludes that the diaphysis of the femur on the side on which the nutrient artery was cut reacted to trauma normally. He states that this artery is essential only to maintain hematopoietic function and plays little or no part in callus formation. However, the fact that its destruction tends

to cause calcification in the medullary canal, suggests that it is a factor in the prevention of aberrant calcification. BARBARA B. STILES, M.D.

Sever, J. W. Non Union in Fracture of the Shaft of the Humerus. *J. Am. Med. Ass.* 1935, 104: 32.

Transverse fractures of the middle third of the humeral shaft frequently fail to unite and therefore present a serious problem. The author reports five cases free from his own practice. The first case is a fractured humerus as it was originally reported in 1933. It was a case of complete absorption of the humeral shaft following a fracture with two satisfactory fractures. The specimen is in the Warren Museum at the Harvard Medical School. The second case was seen by the author after a long bone grafting. The humerus of the arm had failed to unite. The patient refused further operation. In the last three cases operation was performed by the author. In the first the application of a sliding graft was followed seven months later by a deep operation in which a large osteopneumatous graft was applied. The patient refused further attempts to correct the non union.

In the author's second case there were multiple fractures. About three months after the injury a step approximation of the united humeral fragments was followed by prolonged immobilization. A second procedure five months later with the insertion of a beef bone graft and a heavy osteopneumatous graft appeared to result in union after five months but non union was present a year later. In the third case the author countersunk a massive tibial graft eight months after the injury. Non union recurred five months later following vigorous physical therapy.

The author discusses some of the causes of non union. He believes that in cases such as those under discussion the only operative probable ortho while is that ad osseated and well carried out by Campbell and Henderson, namely, the application of a massive or only graft followed by a sufficient long period of fixation to insure union and carry the patient beyond the period of absorption and possible fracture of the graft. However, even this procedure is not infallible. BARBARA B. STILES, M.D.

Rogers, W. A. The Treatment of Fractures of Vertebral Bodies Uncomplicated by Lesions of the Cord. *Arch. Surg.* 1935, 30: 234.

The author reports the findings of a study of the clinical course and early results of recent fractures of vertebral bodies without injury to the cord, the mechanics of the reduction of such fractures by hyperextension, and the mechanism of possible injury to the cord during the reduction. This study was made in thirty one consecutive cases seen in the period between 1925 and 1932. Rogers stresses the need for early accurate diagnosis and adequate careful roentgenographic examination. From a careful study of the anatomical findings of Schmorl and his co-workers and from his own experience he concludes

that the nucleus pulposus acts as the fulcrum between vertebrae and that the axis of motion lies along a line drawn through the point where the greatest relative pressure of each intervertebral disk falls on its contiguous vertebra. For all practical purposes, this line falls through the nuclei pulposi near the deepest point of concavity of the articular surfaces of the centrum. Extension of the vertebral column therefore exerts decompressing force on the portions of the vertebrae anterior to the line of the nuclei pulposi and pressure along those portions posterior to it. Compression fractures may be associated with injury to the nucleus pulposus.

Rogers divides his cases into the following four groups:

1. Fractures in which destruction of the disk was slight or absent. Eight (26 per cent) of the cases fell into this group. An excellent reduction was obtained in all.

Fractures in which the superior or inferior surfaces of the centrum and the adjacent intervertebral disk were extensively disorganized. Sixteen (5 per cent) of the cases were of this type. Satisfactory correction was obtained in all.

3. Fractures in which the compression was central rather than anterior or lateral. Two (6 per cent) of the cases were in this group. Little or no decompression could be obtained by extension.

4. Fractures with dislocation of the adjacent vertebra above. Five (6 per cent) of the cases were in this group.

If during extension, the dislocation is not reduced and the posterior bony processes do not lock, injury of the cord may occur. The author agrees with Davis regarding the importance of the anterior longitudinal ligament as a factor in reduction by extension. He believes that complete hyperextension is essential for the best results. He describes his hyperextension method in detail. Complete hyperextension is obtained in short space of time by means of a canvas frame on adjustable supports. A plaster jacket is then applied (without moving the patient). The whole procedure requires only about an hour and half. No anesthetic is necessary but an average dose of morphine-scopolamine may be administered. The time of correction was at first number of days, but has been gradually shortened to from fifteen to sixty minutes.

The details of thirty-one review of cases are presented in tables. It is found that reductions started within seventeen days after the injury were uniformly successful whereas those started later were either partially or entirely unsuccessful. During the process of reduction all of the patients were carefully watched for evidence in voluntary muscle action in the lower extremities, loss of reflexes, and twitching suggestive of impending injury to the cord. Only one case as there any such manifestation. In 1 case acute local pain developed at the fracture site and extension was stopped.

For fixation, either plaster-of-Paris shells or jackets were used. The latter allowed the patient to be

ambulatory. Cases in which the fractured vertebra lies in the anterior convexity of the spinal column are considered satisfactory for ambulatory treatment. When the fracture is higher recurrent treatment is necessary. The technique of the application of a jacket is described. The period of fixation in plaster until reorganization of the bone has occurred, is from two to seven months and is followed by the application of high spring steel back-brace also maintaining hyperextension. The brace is worn until the muscles have regained their strength, usually from the fifth to the seventh month. After the brace is discarded deep lumbar lordosis remains and must be corrected by adequate postural exercises.

Of the cases reviewed, narrowing of the intervertebral space occurred in 6 (54 per cent). Only (65 per cent) of the patients returned to the activities in which they had been engaged before the injury and remained free from pain. Six returned to lighter activities. The details of the cases of the patients who failed to return to work are presented in a table. The author believes that spinal fusion is not indicated as a routine procedure but is necessary in fractures with dislocation when adequate correction cannot be obtained. In 45 per cent of the cases no review, complete bridging of bone across the intervertebral region occurred without operation.

In summarizing, the author says:

In cases of recent fractures of vertebral bodies it is possible to re-establish the mechanics of the back as they were before the injury (96 per cent of the cases reviewed).

1. Recent fractures and dislocation are more difficult to reduce (40 per cent of the cases reviewed).

2. Part of this correction is usually lost as the result of gradual narrowing of the injured intervertebral disk (84 per cent of the cases reviewed).

3. The back is capable of remarkable degree of adaptability to these changes (65 per cent of the patients whose cases are reviewed returned to their pre-injury activities after an average of eight and one third months and remained free from symptoms).

4. Re-organization or union of bone occurred in all of the cases reviewed and in most cases is probably fully adequate after from 2 to seven months.

BARBARA B. STINEBAUGH, M.D.

Contiades, X. J. and Politis, A. M. The Surgical Treatment of Recent Depressed Fractures of the Tibial Articular Surface (A propos de traitement chirurgical des fractures récentes articulaires récentes du plateau tibial par enfoncement). *Presse Méd. Par.* 935-43-44.

The authors report two cases of depressed fracture of the external condyle of the tibia. Both were treated early by open reduction with fixation of the depressed fragment in place by bone edges. In the first the approach was extra-articular. In the second, it was intra-articular and torn external semilunar cartilage was removed. The authors believe that arthrotomy is of distinct advantage as it exposes injuries to the cartilage, frequent complica-

cation, and renders it possible to reduce the fragment accurately. The use of wedges is of value when the depressed fragment is too small to be held by a screw. Early postoperative motion can be aided by injecting novocain and acetylcholine.

The pathological anatomy, mechanism, and clinical picture of the fractures under consideration are discussed briefly.

BARBARA B. STIMSON, M.D.

Masmonteil, F. The Treatment of Malunion of the Ankle (Du traitement des cals vicieux du cou de-pied) *Bull et mem Soc d chirurgiens de Par*, 1934, 20 634

In malunion in the region of the ankle joint the surgeon is frequently presented with a very difficult problem. The author believes that in many cases the condition could have been prevented by more adequate reduction at the time of the injury or more careful and prolonged immobilization with frequent checking of the position of the fragments by roentgenography. He states that he prefers immobilization of the foot in a slightly varus position rather than the forced varus position advocated by Bostot or the neutral position of Boehler.

In discussing the pathological changes and operative treatment of malunion of the ankle he leaves out of consideration fractures of the lower shaft and supra articular fractures, all of which he believes should be treated by cuneiform osteotomy. He describes four modifications of the normal joint which can be caused by malunion: (1) modification of the dimensions of the mortise of the joint, (2) modification of direction (valgus or varus deformity of the foot), (3) modification of situation (forward or backward displacement of the foot), and (4) modification of orientation (the internal malleolus in front, the external malleolus carried backward, and the foot deviated outward).

The author next discusses the operative correction of widening of the mortise, malunion in valgus, equinovarus in cases with fracture of the posterior tibial lip, and talovarum.

In cases of widening of the mortise he replaces the fibula in its tibial articulation after cleaning out the latter and then fixes the bones in place with two screws.

For the correction of malunion, cuneiform, osteotomy, astragalectomy, and open reduction with or without osteosynthesis have been proposed. The author believes that unquestionably the ideal operation is that which replaces the bony elements in their normal position, though this is very difficult in the late cases. He therefore advises open reduction not later than two years after the injury. He states that it is particularly important to clean out the new bone formation to allow the fragments to go back into place. If the bone is sufficiently solid, one or two screws may be inserted to maintain the position obtained. In cases complicated by a tibioastragalar ankylosis a complementary astragalectomy should be done.

Cases of the equinovarus deformity which occurs with fracture of the posterior tibial lip should be treated in the same way as the preceding group, but always with complementary astragalectomy.

Simple varus deformity is simply corrected by cuneiform osteotomy.

For cases of talovarum deformity a complementary astragalectomy with correction of the position is advised. In the author's opinion the ideal operation is a double osteotomy with open reduction of the fragments followed by complementary astragalectomy in cases complicated by fracture of the posterior lip.

The article is illustrated with diagrams and roentgenograms.

BARBARA B. STIMSON, M.D.

# SURGERY OF THE BLOOD AND LYMPH SYSTEMS

## BLOOD VESSELS

Bary and Rebooul, H. A Critical Study of Arteriography (Etude critique sur l'arteriographie) *Bull. de méd. Soc. nat. de chir.* 915, 6 2.

Bary and Rebooul report the case of a man fifty-four years old who sought treatment for painful cramps in both arms, especially the right, and an alteration involving the middle and index fingers of the right hand. The radial pulse was easily perceived. The condition was thought to be due to syphilis. An arteriogram made following the injection of 1 ccm of a 45 per cent solution of tenebryl into the brachial artery in the bicipital groove showed the palmar arch poorly filled and its some areas entirely obliterated. The arteries of the thumb or visible, but those of the fingers or entirely obliterated. A second arteriogram taken eight seconds after the first, without an additional injection of tenebryl, showed the opaque medium still entirely in the arteries, an unusual phenomenon. After the patient returned from the roentgenological department (he arm and hand remained cold, a patch of cyanosis persisted near the elbow, sensation was entirely lost and movement was impossible in few days the entire arm and hand became completely mummified. There was no infection.

Such a sequel to arteriography as entirely unexplained. The same day the same solution of tenebryl had been injected into the aorta for the study of large aneurysm of the abdominal aorta. In another case, without the slightest ill effect. Moreover a large series of arteriograms have been made in the authors clinic (thoracic vessels). The authors have found arteriography with tenebryl of value in the study of various types of arterial obstructions and aneurysms to determine the extent of the lesions and the efficiency of the collateral circulation. The patient from whose case is reported was suffering, not from a lesion of the blood vessel alone, but from a vasomotor disturbance. The authors therefore suggest that in such disturbances arteriography should be considered for the present contraindicated.

ALICE M. MERRILL.

Lereuf, J. The Dangers of Arteriography (Les dangers de l'arteriographie) *Bull. de méd. Soc. nat. de chir.* 915, 6 6.

Lereuf reports the occurrence of serious consequences following the injection of tenebryl into the brachial artery for arteriography in the case of a child ten years of age who had typical Volkmann's contracture following a fracture of the humerus three injections of 6 ccm each of 45 per cent solution of tenebryl were made. Shortly after the last injection the hand became blanched and the hand

and forearm cold. These changes were followed first by venous congestion and cyanosis of the hand and arm and finally by gangrene which necessitated amputation with disarticulation at the shoulder.

A study of the amputated arm disclosed old cicatricial lesions in the brachial artery; the site of and below the fracture and recent obliterating thromosis above it in the region where the injection of tenebryl was made and in the collateral vessels. These had caused ischemia and pathological changes in the muscles that are much more recent than those characteristic of Volkmann's contracture. Therefore the injections of tenebryl had caused, first, a second, a thrombosis in the region of the hand and third, ischemic gangrene of the brachial artery.

The author states that such a serious accident had never occurred before in his practice as a result of arteriography. Arteriography has been used to good advantage by others in Volkmann's contracture without ill effects and has clearly demonstrated the site and the extent of the arterial obstruction. As Lereuf has been unable to determine the reason for the accident in the case he reports he believes it should be freely discussed in order to deter the indications for arteriography and the dangers of the procedure.

ALICE M. MERRILL.

Windfield, F. The Blood Changes in Clinical Thrombophlebitis and Their Diagnostic Importance (Die Blutveränderungen bei klinischer Thrombophlebitis und ihre diagnostische Bedeutung) *Acta chir. Scand.* 914, 75 46.

F on his studies of the blood changes occurring in thrombophlebitis the author draws the following conclusions:

1. The changes occurring in the blood in thrombophlebitis, after operations, and after fractures are, on the whole, similar but in thrombophlebitis they are less characteristic and less marked, especially those in the globulin and viscosity.

The blood changes are no index of the magnitude of an operation nor of the extent of the thrombosis since even minor uncomplicated operations such as herniotomy may be followed by fatal thrombosis and embolism.

2. Neither the magnitude nor the nature of the blood changes constitutes an index of complications, and it is scarcely to be expected that the blood changes so far recognized will become an aid to the early recognition of beginning thrombosis.

3. Our ignorance of many of the processes upon which thrombosis depends is a great hindrance to determining whether one or the other change in the composition of the blood is of importance for the origin of thrombosis.

## BLOOD, TRANSFUSION

Kosdoba, A S The Haemostatic Properties of the Bone-Blood Mass "Sangos" An Experimental Study (Blutstillende Eigenschaften der Knochenblutmasse "Sangos", Experimentelle Untersuchung) *Mitt a d Grenzgeb d Med u Chir*, 1934, 43 465

While removing bone fragments for transplantation purposes the author observed that the chips mixed with blood possessed haemostatic properties. To study the haemostatic action of such chips he carried out a series of experiments in which operations were performed on the vertebral column, skull, and long bones. Bone splinters from the same animal, from another animal of the same species, from an animal of a different species, and even from dead bones were used. In another series, the bone chips were taken from the experimental animal while the blood was from an autogenous, homogenous, or heterogenous source. In further experiments the bone was mixed with blood clots and citrated blood from various sources.

In all of the experiments the bleeding from the bone ceased within from five-tenths of a minute to five minutes after the application of the blood-bone mass, which the author calls "Sangos". Post-operative haematoma were not seen. The haemostatic action of the bone-blood mass is certainly not entirely mechanical, the large quantity of thrombokinase present probably also plays a rôle. The author proposes to study the haemostatic action of the bone blood mass in operations not performed on bones. (ZWICKER) LEO M ZIMMERMAN, M D

Bagdasarov, A The Problem of Blood Transfusion (Das Problem der Bluttransfusion) *Verhandl d 23 Kong d Chir d U d S S R*, Moscow, 1934, p 115

The Central Institute for Blood Transfusion in Moscow strongly recommends the citrate method. As a method for use in large numbers of cases, direct transfusion has great disadvantages as the location of donors and recipients is difficult to control under war conditions, the complicated apparatus requires assistants, and the use of this method excludes the use of postmortem blood. Among 1,700 cases of the most varied diseases and forms of anaemia in which blood transfusion by the citrate

method was done there was none in which an injurious effect was noted. The Institute has developed a very simple apparatus for the transfusion of citrated blood which can be used even under wartime conditions. In the cases reviewed the donors bore the loss of blood very well. The blood picture was fully restored to normal after from thirty to thirty-five days. Preservation of the blood with glucose showed an increase in the lactic-acid content and therefore was discontinued.

The preserving fluid used at the Institute contains sodium chloride, 7.0 gm., potassium chloride, 0.2 gm., magnesium sulphate, 0.4 gm., and sodium citrate 5.0 gm per liter of water. This solution has the advantage of great stability of its alkaline reaction. The resistance of the erythrocytes decreases only slightly. The leucocytes are destroyed in the first few days. A good therapeutic effect can be obtained even after three weeks of preservation. A slight reaction in occasional cases does not restrict the indications. Transportation of the preserved blood for considerable distances did not cause any serious damage to it.

For distant transportation blood plasma is quite suitable. The questions of plasma transfusion and plasma preservation are being investigated.

The investigations of Šamov and the first clinical results of Sakajan placed the transfusion of cadaver blood on a firm basis. Subsequent investigations have established the practical importance of this problem.

Spasokukockij experimented with the infusion of eclamptic blood with good results. The author rejects the idea of rejuvenation by blood transfusion as suggested by Bogdanov in his theory of physiological collectivism and a copulation or conjugation of the cellular elements of the donor with those of the recipient. He maintains that the therapeutic effect of blood transfusion depends on two factors, substitution and stimulation.

The Institute has a number of branches in various states of the Soviet Union which are affiliated with larger surgical divisions. The purpose of these branches is to create propaganda for blood transfusion, to teach it to greater numbers of physicians, and to perform it scientifically in cases in which it is indicated.

(EUGEN BANNER VOIGT) PHILIP SHAPIRO, M D

# SURGICAL TECHNIQUE

## OPERATIVE SURGERY AND TECHNIQUE POSTOPERATIVE TREATMENT

Hyman, H. T. and Torroff, A. S. W. Therapeutics of the Intravenous Drip. Further Observations. *J. Am. M. Ass.* 935, 94, 446

The above review recent series of 1,000 consecutive experiences at the Mount Sinai Hospital, New York City with the slow continuous intravenous infusion ("drip") for the purpose of demonstrating the numerous indications for the use of this infusion and its effectiveness as a therapeutic measure in surgical and medical cases.

The therapeutic indications included (1) the treatment of hemorrhage, (2) the treatment of shock, (3) the treatment of infectious medical and surgical diseases, (4) the prevention of complications following extensive or shock-producing surgical procedures, (5) the prophylaxis and treatment of thyrotoxic crises, (6) the alleviation of postoperative complications such as vomiting, ileus, gastric distention, oliguria, and anuria, (7) the treatment of various metabolic and toxic conditions such as the alimentary toxicosis of infancy, dehydration from uncontrollable vomiting or diarrhea, urinary suppression, and diabetic ketosis, and (8) the treatment of exogenous poisoning.

As prophylactic and supportive measure in various surgical conditions, the drip is usually started before the patient comes to the operating room and is continued during and for varying periods of time after the operation. When necessary, transfusion is easily performed by adding citrated blood to the solution. In the surgery of diabetes, a liberal supply of fluid, dextrose, and insulin can be readily administered.

The direct introduction of drugs and biological preparations in the treatment of postoperative complications is accomplished easily by simply adding them to the solution. Thus, in shock or collapse, ephedrin, epinephrin was added; in postoperative ileus, pituitrin in acidosis, alkali with glucose and insulin in sepsis, whole blood (non-specific) in certain types of sepsis, specific serum and in thyrotoxic storm, iodide.

In medical cases the drip was employed in the treatment of anoxemia with nephritis, dehydration, hemorrhagic diseases, and chemical poisoning. Specific sera (pneumococcus, tetanus, and diphtheria) could be administered in doses of from 100,000 to 300,000 units daily as required without causing an undue reaction. In the cases of 5 patients with nephritis 4 gm. of neo-nephrenamin were given in 4 days with good effect.

The drips were maintained for from several hours to only four days. Chills or febrile reactions occurred comparatively seldom and in practically

every instance are due to technical errors. At the Mount Sinai Hospital the intravenous method has practically replaced the subcutaneous method of introducing fluids. The former has the advantages of more certain absorption, greater adaptability, less discomfort to the patient, and the possibility of introducing drugs and blood directly into the circulation. At the seemingly slow rate of 1 or 3 ccm. per minute, the drip will introduce from 1,500 to 4,000 ccm. of fluid daily and by simple, single technical procedure the problem of nutrition and the introduction of fluid, salt, drugs, blood, and serum is solved.

Warthen, H. J. Massive Intravenous Injections. An Experimental Study. *Arch. Surg.* 935, 30, 99

The experiments reported are carried out on dogs. The amount of fluid injected ranged from 57 to 394 ccm. per kilogram of body weight, and the average amount injected for the entire study was 144 ccm. per kilogram of body weight. The average duration of the infusions was twenty-four minutes. The author's findings and conclusions are summarized as follows.

Large amounts of the solutions usually employed for infusions may be injected intravenously in dogs without causing death or evidence of cardiac embarrassment. Injections of excessive amounts of fluid result in cerebral or pulmonary edema.

The most favorable chemical changes in the blood occur with infusions of isotonic solutions of dextrose and sodium chloride. A 5 per cent solution of dextrose causes slightly more desirable changes than a 7 per cent solution of sodium chloride. Infusions of hypertonic solutions of dextrose and sodium chloride cause distinctly unfavorable changes.

3. The blood sugar value increases following infusions of 7 per cent sodium chloride solution and decreases following infusions of hypertonic sodium chloride solution.

4. Large infusions of dextrose and of sodium chloride solutions cause little if any change in the fragility of the red blood cells.

5. There is marked acceleration of the pulse rate during intravenous infusions.

6. The intravenous injection of fluids results in an initial rise in the arterial blood pressure. During infusions of isotonic solutions this is followed by secondary fall to or slightly below the pre-injection level. During infusions of hypertonic solutions the secondary fall is diminished or absent.

7. There is marked increase in the venous pressure during large intravenous infusions.

8. Diuresis is most marked following infusions of 5 per cent dextrose solution.



9) Edema of the subcutaneous tissue does not occur following the rapid intravenous injection of large amounts of fluid. Edema of the wall of the stomach and of the intestine associated with fluid in the gastro-intestinal tract and the peritoneal cavity occurs following large intravenous infusions.

10) In dogs, the intravenous infusion of a 10 per cent dextrose solution is often fatal.

SAMUEL K. JEN, M.D.

Davies, G. F. S. Pulmonary Embolism. *Med. J. Australia*, 1935, 1: 171.

The possible presence of a pulmonary embolus should always be considered at postmortem examination. Before the heart or lungs are removed an incision should be made into the right auricle and the main branches of the pulmonary artery. In removal of the lungs or heart there is danger of losing a pulmonary embolus. The embolic blood clot may be found extending from the right auricle into the main stem of the pulmonary artery or blocking the artery at its bifurcation or occluding only one main branch of the artery, either the right or left.

The clot is formed in either a femoral or a saphenous vein, never in the pulmonary artery. Its diameter is smaller than the caliber of the vessel it obstructs. The occlusion is caused by continual folding of the embolus upon itself until the obstruction of the lumen of the vessel is complete. Factors involved in the development of embolism are: (1) the rate of the blood flow, (2) the coagulability of the blood, (3) pathological changes in the vessel wall, (4) the patient's age, (5) the condition of the heart, (6) the presence of an abdominal incision, and (7) confinement to bed.

Aschoff has shown that eddies formed in a slowed blood stream start the process of blood clot formation. The thrombi are made up of three parts: (1) a thin white layer, which is the first layer formed; (2) a thicker mixed layer made up of white and red layers; and (3) a red layer which forms the main bulk of the thrombus. Microscopic examination of the white part of the clot in relation to the vessel shows that it is made up of parallel lamellae which radiate obliquely from the vessel wall. The markings of Zahn are white ridges extending from the white layer of the clot through the mixed layer. The lamellae and the markings of Zahn are made up mainly of blood platelets deposited by a slowed blood stream and built up in parallel layers. This process continues until the white part of clot occludes the vein. The red part of the clot consisting of red blood cells and fibrin is then formed and added to the white part. The red layer is more compact and firmer than the usual postmortem clot.

In the cases reviewed by the author the incidence of pulmonary embolism was highest in the sixth decade of life. Carcinoma of the stomach does not seem to have any particular influence on the occurrence of embolism. An anterior abdominal incision is an important factor favoring embolism because of the resultant stasis of the blood in the abdominal cavity.

necessary and in assisting the return flow of blood from the extremities and abdomen to the heart. In cases in which an incision has been made in the anterior abdominal wall the average age of death from pulmonary embolus is forty six and a half years whereas in cases in which an incision has been made elsewhere it is sixty-four and seven tenths years.

After a surgical operation there is a definite marked rise in the number of blood platelets. This is demonstrable on the sixth day. The maximum is reached on the tenth day. This increase may therefore be an important factor in venous thrombosis.

In the cases studied, the author was unable to demonstrate histological changes in the vessel wall where the thrombus formed. Anemia and cachexia may alter the character of the vascular endothelium, but there is no exact method of estimating their influence. The majority of the author's cases of pulmonary embolism showed no evidence of sepsis or infection. If thrombosis occurs in such cases the thrombi appear to be firmly attached to the vessel wall and are less likely to break off. Phlebitis is therefore rarely found in cases of embolism. Time appears to be of no importance as embolism has occurred in the author's cases on the day of the operation and as late as the eleventh day after the operation.

BENJAMIN G. P. SHAPIROFF, M.D.

#### ANTISEPTIC SURGERY, TREATMENT OF WOUNDS AND INFECTIONS

Fior, W. B. The Roentgen Treatment of Carbuncles. *Int. J. Roentgenol.*, 1935, 33: 71.

The author believes that roentgen irradiation is not used in the treatment of carbuncles nearly as frequently as its value warrants. He briefly reviews the reports on this treatment made by others and gives his own experience with it in fifty six cases during the past three years.

In the majority of his cases a small incision to establish drainage was necessary in addition to the irradiation but not infrequently the lesion opened spontaneously, drained freely, and healed normally after roentgen irradiation alone.

In the usual course of events an increase in the pain and temperature occurs from two to three hours after the treatment. This is followed by marked relief of the pain within a few hours and disappearance of the induration. After from twenty-four to forty-eight hours the lesion appears to be sharply localized, it drains through a single opening, and general subjective improvement is noted. The acute inflammatory phase of the lesion usually subsides entirely within about two weeks, and the carbuncle formation is minimal.

In the technique used by the author from two to four units of moderately penetrating rays are employed either with or without aluminum filters depending upon the depth of the lesion or its recurrence to necessitate's areas. The treatment should be given as early as possible, preferably before suppuration has occurred, with a view toward achieving a radical cure of the disease process.

The mechanism of production of the beneficial changes within inflammatory areas has not been definitely ascertained, but the evidence suggests that lymphocytic destruction is a factor in the early defense reaction.

ADOLFO HARTONO, M D

### ANESTHESIA

Pizzagalli, R.: The Behavior of Certain Reflexes of Periosteal and Articular Origin in Various Types of Surgical Anesthesia. (Sui comportamenti di alcuni riflessi di origine periosteale ed articolare in vari tipi di anestesia chirurgica). *Spesimologia*, 1934, 25, 635

Orthopedists are familiar with the fact that during operations on the bones or the large joints some patients show a dangerous deterioration of the general condition manifested by cardiac weakness and slow irregular and superficial breathing. The fact of even a deeply anesthetized patient expressing suffering. These reflexes, which coincide with the moment the periosteum is reached or a joint is opened, are not generally mentioned in treatises on anesthesia or orthopedics and apparently have not been studied experimentally. They are sometimes seen also in accidental trauma to the bones and joints.

Pizzagalli studied the blood pressure and respiration of forty-four dogs and rabbits during operations on the bones and joints (periosteotomy, opening of the medullary canal, and opening of various joints) under anesthesia of different types (inhalation, rectal, intravenous, infiltration, and nerve blocking). All of the animals except those in which the anesthetic was injected into the nerve trunk or the joint capsule showed a transitory drop in the blood pressure whatever the anesthetic used and even in deep narcosis. The blood pressure reached its lowest point, which in some instances amounted to a fall of from 50 to 60 mm. Hg. in a period of 6 or 7 pulsations after the moment of stimulation and returned to normal after from 3 to 20 pulsations. The intensity of the reaction varied according to the anesthetic and the site and nature of the operation, probably according to the number of nerve terminals affected and the strength and duration of the stimulus. It increased in the following order: opening of the medullary canal, incision of the periosteum, arthrotomy on the knee, arthrotomy on the hip, and operations involving great traumata to articular surfaces. The respiration was always less affected than the blood pressure.

Inhalation narcosis, even when pushed to the limit of safety, usually produced lighter effects than intravenous or infiltration anesthetics. The degree of hypotension was inversely proportional to the narcotizing property of the drug. Ethyl chloride produced the greatest oscillations of blood pressure, chloroform the smallest, while the effect of ether was intermediate. The intravenous injection of barbiturate derivatives and the various types of infiltration anesthetics caused ample and prolonged oscillations of blood pressure.

The constancy of these phenomena demonstrates that after the other reflexes (cutaneous, ocular and visceral) have been abolished by an anesthetic, osteo-articular reflex variations of blood pressure still persist. The depth of anesthesia has only quantitative influence on them. The stimulus arises at the site of operation, reaches the bulbar centers, and thence is transmitted through the vagi to the heart. The arc can be broken by:

1. Interference with the efferent path by section of the vagi or their functional interruption by general atropinization.

2. Pharmacological blocking of the afferent path by:

a. Anesthetizing the site of origin of the reflex. Injection of novocain beneath the periosteum or into the joint capsule abolishes the reflex.

b. Blocking the nerve trunks supplying the structures. In the experiments these procedures either prevented the reflex or reduced it to the minimum.

In the author's opinion his findings justify the increased favor with which inhalation anesthesia has been regarded in recent years. In bone and joint surgery inhalation anesthesia is the anesthesia of choice. Deep narcosis induced with a drug acting powerfully on the nerve centers is less dangerous than a light narcosis or the use of drugs with anesthetic properties. The prophylactic use of atropine and the injection of an anesthetizing solution at the site of operation appear reasonable.

The article has a bibliography.

M. E. MONROE, M D

North, J. P.: The Use and Abuse of Spinal Anesthesia. *Ann. Surg.* 1935, 101, 702.

In determining the advantages and disadvantages of spinal anesthesia in a given case the following four questions must be answered:

1. Is full muscular relaxation essential?
2. Does the condition of the patient require his tissues to be spared the toxic effect of ether, ethyl, or chloroform?
3. Are there definite contra-indications to the use of spinal anesthesia?
4. Does the operation justify assumption of the risk associated with the induction of spinal anesthesia?

Full muscular relaxation is necessary in cases of early intestinal obstruction in which extensive exploration is required, cases of perforation of vesical, large hernia, diaphragmatic hernia, and conditions demanding gastroenterostomy or other deep operative work, and certain cases of fractures.

In advanced biliary disease, diabetes, and acute or chronic respiratory disease it is important to prevent a toxic effect from the anesthetic agent and guard the respiratory tract against irritation. Pre-existing respiratory tract diseases must not be confused with postoperative pulmonary complications.

Because of its tendency to lower the blood pressure spinal anesthesia is undesirable in cases in which sudden lowering of blood pressure may be harmful.



# PHYSICO-CHEMICAL METHODS IN SURGERY

## ROENTGENOLOGY

Schubert, E. von. Three Years Preliminary Experiences in the Treatment of Cancer with Extremely Hard Roentgen Rays (Vordruck des dreijährigen Erfahrungs mit der Röntgentherapie mit extrem harten Röntgenstrahlen). *Strahlentherapie*, 1934, 5 7

After three years' experience with the gamma ray apparatus von Schubert reports that it is technically perfect. From the economic point of view he believes that the cost of operation, though high, is bearable. The renewal of the tubes is especially expensive as tubes last only about three hundred and fifty hours and it costs 7 RM (about \$68.00) The tube gives off only from 1 to 4 per minute. Homogeneous irradiation of the pelvis may be obtained by using 4 large fields (377.5 sq. cm.) By spreading the treatments over period of three weeks, dosage of 3,000 per field may be given. In treatment by massive irradiation which is given in two days because of the small doses, 1,500 per field may be administered. Beginning dermatitis usually heals without reaction in from four to six weeks. When the roentgen irradiation is to be combined with radium irradiation (from 3,000 to 4,000 mgrm hrs) the blood picture should be allowed to return to normal after the first treatment (roentgen or radium irradiation) before the second treatment is begun.

In irradiating the ovary of the white mouse with ultra-hard rays von Schubert was unable to determine any distinct biological effect. On the other hand, Stubbe observed doubling of the rate of maturation of the anaplasia after irradiation of its pollen with rays produced by from 5 to 75 kv. It is as yet impossible to form definite opinion as to the effectiveness of the ultra hard rays because only very advanced cases have been treated by this form of irradiation, the period of observation has been too short, and uniform irradiation has been given, and the cross-fire method, with its greater possibilities for sparing the healthy tissues, has not been attempted.

(Wienheim) JOHN W. BRIDGMAN, M.D.

Martin, H. E. The Fractional or Divided Dose Method of External Irradiation in the Treatment of Cancer of the Pharynx, Tongue, Larynx, and Paranasal Sinuses. *Acta radiol.* 1935, 16 1.

The essential principles of the irradiation method of Coutard are outlined and discussed. The author states that an attempt at exact duplication of Coutard treatment factors and technique is probably neither necessary nor advisable since identical equipment is seldom available. The universal use of the divided-dose method of irradiation therapy

as developed by Coutard has undoubtedly been hindered by attempts at exact duplication of Coutard's technique and disregard of the logical application of the more important general principles.

The author gives a detailed description of the techniques and treatment factors used in the Head and Neck Service of the Memorial Hospital, New York City since 1933. With the use of the divided-dose principle, over 300 cases of pharyngeal and laryngeal cancer have been treated with X-ray at 300 kv. X-rays at 700 kv. and the 4 gm. radium-element pack.

The types of cases treated, the various treatment factors, and the technique of treatment in individual cases are discussed in detail, and the results in 140 cases treated during the years 33 and 34 are presented and analyzed.

Miescher, G. Experimental Studies on Animals With Regard to the Influence of Fractionating on the End-Reaction (Tierexperimentelle Untersuchungen über den Einfluss der Fraktionierung auf den Spät-Effekt). *Acta radiol.* 1935, 6 1.

The problem of fractional roentgen irradiation was studied experimentally on rabbits ears where the action was judged exclusively by the secondary effect (the condition after observation for from one to four years). The criteria of the effect were thresholds for permanent baldness, atrophy, necrosis, and hyperkeratosis.

The experiments indicate that the increase in tissue tolerance and the fractionating bear relation to one another which can be demonstrated graphically. On account of the present general tendency to increase the total dosage still further in fractional roentgen treatment, the author concludes that the values referable to secondary effects in animals show cause for serious apprehension.

Martin, J. M. and Martin, C. L. Modified "Coutard" Roentgen Therapy. *J. Am. M. Ass.* 1935, 104 605.

The authors trace the progress of high-voltage roentgen therapy from the early single massive dose through the saturation method of Fischer to the more modern fractionated plan of Coutard. The chief objections to the Coutard technique are the length of time and the cost involved in its use. To offset these objections the authors have employed less filter viz. 75 mm. of copper instead of 100 mm. of steel, which produces only slight change in wave length. Their method utilizes 300 kv. target skin distance of 5 cm. filter of 75 mm. of copper and 1 mm. of aluminum, and 6 mm. A case of squamous-cell carcinoma of Grade 3 involving the cheek was selected to check their technique.

Thirty six hundred roentgens divided into twelve equal parts covering a period of thirteen days were administered to the tumor and surrounding area. The skin became red and showed marked desquamation but no ulceration. The tumor disappeared rapidly, leaving only a clean healing ulcer about  $\frac{3}{4}$  in. in diameter. The results indicated that the dosage was correct.

As the authors have used this modified technique for only a little more than a year, they are unable to present statistical data. They have employed it in twenty five cases, most of which were inoperable. The occurrence of improvement in practically every case seemed to justify the temporary discomfort produced. The tumors included carcinomata of the cervix, ovary, breast, rectum, mouth, pharynx, liver and larynx and a radioresistant lymphosarcoma of the mediastinum. Tumors of the pharynx responded miraculously. The authors believe that their modified Coutard technique is as efficient as the French procedure.

EARL F. BARTII, M.D.

### MISCELLANEOUS

Turrell, W. J., Eldinow, A., Wilson, J., Woods, R. S., and Others. Discussion on Short-Wave Diathermy. *Proc Roy Soc Med Lond* 1935 28 305.

TURRELL claims that the thermal action of short wave therapy does not account for the results obtained with this treatment. He suggests that many of the results can be explained better by the disruptive and dispersive action of the impact of the electromagnetic vibrations. These disruptive and dispersive effects will be greatest where the conductivity of the tissues is low, as in bones and fat, and it is in these regions that the therapeutic action of the currents is most obvious. If effects comparable to those obtained in the subcutaneous area were obtained in the deeper tissues and organs, the application of deep wave therapy would be attended by serious risk.

ELDINOW calls attention to the claim that there are marked differences between the biological action of the diathermy current and that of the ultra short high frequency current. He cites the work of various investigators, some of whom maintain that ultra short waves have a specific biological action apart from heat production, whereas others attribute the whole effect of such waves to heat action. He re-

ports investigations of his own in which he found that bacteria remained undamaged by lethal doses of ultra short waves and blood showed no change in fragility, sedimentation rate, or bactericidal power following exposure to ultra short waves *in vitro*. He concludes that the effect of ultra short waves is a coagulative necrosis and extreme vasodilatation, which is similar to the effect of diathermy high-frequency currents of about 300 meters.

WILSON disagrees with some of Turrell's theories, particularly those relative to the "pounding and disruptive action" of short waves. She believes there is no disruption of atoms by a current of displacement, that the effect is a vibration of every electron in each atom of every capacity branch traversed by the lines of force. She describes various types of machines used in short wave therapy and expresses a preference for those of the valve type. She calls attention to the fundamental differences between long wave diathermy and short-wave therapy.

WOODS states that there appears to be ample experimental and clinical evidence that the effects of short wave therapy are not confined to superficial tissues. It is possible to eliminate most of the effects on these by varying the wave length, although knowledge of the relationship between the depth of the effect and the conditions of exposure is still very incomplete.

WEBSTER discusses especially the clinical application of short wave therapy. Most of his cases were of the fibrositis lumbago sciatica type. All responded well after only a few treatments. A small group of painful malignant recurrences seemed to respond more favorably to combined short wave diathermy and roentgen therapy than to roentgen therapy alone.

RUSSELL discusses burns in short wave therapy. He states that the accumulation of moisture from sweat under the electrodes or contact of the cables with the skin may be responsible for burns, but can be easily avoided by precautionary measures. Among the conditions which he has been able to influence favorably by ultra short-wave therapy are boils, abscesses, carbuncles, lymphadenitis, tinnitus aurium, prostatitis, osteomyelitis, septic acne, asthma, osteo-arthritis, gonococcal arthritis, sprains, contusions, pneumonia, and beginning colds.

ADOLPH HARTUNG, M.D.

## MISCELLANEOUS

### CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

O Shauithneemy L. and Moore, D. The Etiology of Traumatic Shock. *Brit. J. Surg.* 935 589

The authors distinguish traumatic shock from shock resulting from intestinal obstruction, general peritonitis, and external burns of the skin. Following a review of the experimental investigations and opinions of others (with regard to traumatic shock) they report the findings of their experimental studies. In the latter which were carried out on 100 cats anesthetized by the intravenous injection of

0.3 gm. of chloralose per kilogram of body weight in 5 cc. of water the blood pressure was recorded by means of a carotid cannula and mercury manometer. Trauma was inflicted by a blow with heavy iron bar on a thigh. While the skin remained intact, the femur was broken and autopsy revealed considerable injury to the muscles of the thigh. None of the animals was allowed to recover from the anesthesia. The object of the experiments was to reproduce the condition occurring in fatal clinical cases of traumatic shock.

The experiments were divided into 3 groups. In the first group the attempt was made to determine whether toxins were liberated in the area of trauma.

In some of the animals occlusion of the venous return as obtained by ligation of the femoral vein and its tributaries in the groin, the external, internal, and common iliac veins, and the inferior vena cava and its transverse ilioabdominal tributaries, and an injection of histamine then made into thigh. The injection of histamine failed to affect the systemic blood pressure, whereas trauma applied to the limb was followed by

rapid fall in the blood pressure and the development of severe shock with an early fatal termination. In another group of animals perfusion of the traumatized limb as done. This failed to elicit any evidence of the presence in the traumatized tissue of vasodilator substances which might be responsible for general vascular collapse or shock. In third group of animals a search was made for diffusible products in the systemic circulation by method based on vividialysis. The results appeared to rule out causal relationship to the development of traumatic shock of humoral agency produced either locally in the area of trauma or more remotely. They suggested that the circulating toxin may be of such a complex molecular structure that it is incapable of dialysis across colloidal membrane. In fourth group of animals the pathological picture of histamine shock and traumatic shock was studied. A distinct difference was noted in the postmortem findings in the animals dying after the administration of histamine and those dying from traumatic

shock. After histamine poisoning there was a dark diffuse congestion of the intestines. The cut surface of the liver and kidneys bled readily and the omentum was engorged and presented large vessels which were visible macroscopically in the fat streaks. The pancreas presented an intense edema, and the spleen was generally blue and small. The lungs were congested with dark blood, and the heart as well filled. In the animals dying from traumatic shock all of the viscera, but especially the intestines and omentum, were pale. The liver and kidney did not bleed readily when cut, and there was no edema of the pancreas. The spleen was contracted, but red. The lungs were generally pale, and the heart contained little blood.

In the second group of the experimental investigations reported the fluid loss in the area of trauma was studied. In a series of 8 traumatized animals used as controls the average fluid loss into the traumatized limb was found to be 36 per cent of the calculated blood. The authors state that after very severe trauma the fluid loss alone is sufficient to explain the occurrence of shock, but the fact that the amount of fluid lost in the traumatized tissues does not bear direct relation to the length of survival suggests the participation of some other factor. Many investigators have shown that occlusion of the main vessels of a limb prevents the development of traumatic shock. Complete occlusion of the blood supply to a limb can be obtained only by ligating the abdominal aorta, the ilioabdominal artery, the middle sacral artery, the external iliac artery, the profunda femoris artery and the femoral artery and its branches in the groin. Complete obstruction of the venous return is achieved only by ligation of the inferior vena cava and the veins corresponding to the arteries mentioned. The authors refer to limb with such obstruction as an anemic limb. They found that trauma to an anemic limb had no marked effect on the blood pressure although the animals were under observation for many hours. As the nervous paths in such a limb are intact, this observation has been cited as evidence that shock is due entirely to fluid loss. However the authors raise the question

whether such an anemic limb is not in fact also anesthetic. Since, as Blacklock suggested, the sudden onset of shock is the removal of tonus from a wounded limb may be attributed to the sudden loss of fluid, they believe. It is possible also that the sudden restoration of blood supply may release a flood of nervous impulses. In support of this theory they cite the following experiment. After preparation of a cat in the usual way so as to render the right hind limb anemic, another cat was prepared and an anastomosis made between the central and the femoral artery and vein of the latter to the

peripheral ends of the divided artery and vein of the former. The anæmic limb was then traumatized as in the other experiments. Death occurred about two hours later. As there was no evidence of an incidental cause of death, the authors believe it permissible to assume that nerve impulses from the traumatized area were responsible for the fatal termination.

In the third group of their investigations the authors studied the area of trauma as a source of nervous impulses. The relation of the nervous system to the syndrome of traumatic shock was investigated by (1) section of the nerves to the limb, (2) section of the spinal cord, (3) section and destruction of the spinal cord, and (4) the induction of spinal anaesthesia. When an attempt was made to exclude the nervous discharge from the area of trauma, the syndrome was less severe than in the control group. In the control group only 1 cat survived for as long as six hours. The average survival period was three hours and twelve minutes. Every animal showed an appreciable drop in the blood pressure at the end of the first hour after the trauma. However, following nerve section, most of them survived so long that it was impracticable to follow them all to death. In the cases of those which were under observation until death the average survival time was five hours and fifty-four minutes.

The authors conclude that a toxæmia due to the elaboration of histamin or some other depressor substance formed in the traumatized area plays no part in the syndrome of traumatic shock. They believe that the chief etiological factors are local fluid loss and the discharge of nociceptive nervous stimuli. The latter is of greater importance than the former. Attempts to compensate for fluid loss by intravenous therapy are largely ineffective in traumatic shock. Apart from the perfunctory administration of morphine, too little attention has been paid to the nervous aspects of the condition. The body possesses ample reserves of fluid. Its failure to draw on these reserves is due to the continuance of abnormal nervous impulses. The authors suggest that the nociceptive influences might be controlled by the induction of spinal anaesthesia or the injection of a local anæsthetic into the traumatized area.

ALTON OCHSNER, M.D.

Leriche, R., and Lucinresco, E. Heterotopic Osteogenesis Obtained with the Aid of Grafts of Bladder Mucosa in the Muscles or Grafts of Aponeurosis in the Bladder (De l'ostéogenèse hétérotopique obtenue à l'aide de greffes dans les muscles d'un lambeau de muqueuse vésicale ou de greffes d'aponévrose dans la vessie). *Presse méd.*, Par., 1935, 43, 137.

In an effort to study osteogenesis without the action of periosteum, endosteum, or osteoblasts, the authors repeated the experiments of Neuhoff and Huggins on seventeen days.

In two animals a strip of fascia was grafted in the bladder wall after ablation of a fragment of the serosa and muscularis, the mucosa being left intact. No ossification occurred in the grafts.

In five animals a strip of fascia taken from the outer surface of the thigh was grafted in the bladder wall after a defect measuring 2 by 4 cm. in diameter which included the mucosa had been created. In four of the animals ossification of the transplant resulted. In the fifth, the graft was lost.

In eight animals strips of bladder mucosa were grafted in different muscles, in muscle septa, and in cellular subcutaneous tissue. Ossification resulted in seven. In the eighth, suppuration occurred and the graft was eliminated.

In two animals grafts of the bladder wall deprived of mucosa were used. No ossification was obtained.

In the experiments in which grafts of bladder mucosa were implanted in muscle, studies were made from the first to the one hundred and thirtieth day. In the beginning the transplanted mucosal cells multiplied rapidly, the epithelium forming small nodules. Soon there appeared in the center of each of the nodules a small cyst filled with a bloody fluid which later became brownish and viscid. Around these cysts an active connective tissue reaction took place with the formation of numerous young fibroblasts and blood vessels. By the end of from fifteen to twenty days the connective tissue had assumed a collagenous appearance and calcium had begun to appear. By about the thirtieth day ossification was quite definite. In several instances the pericystic tissue was transformed into cartilage which later was invaded by bone similar to the process seen in normal cartilaginous ossification. Ossification continued until a true bony tube was formed. In the interior of the space limited by bony trabeculae, first small sinusoidal vessels and later nucleated red cells, megakaryocytes, and other cells typical of normal bone marrow appeared. Around this osseous tube there developed a layer of fibrous tissue resembling periosteum in appearance and giving the graft the picture of normal bone.

Analysis of the liquid in the cysts showed that in the first few days the calcium content was similar to that in normal blood serum but later, as the fluid became more concentrated, the calcium content increased. In the tissues surrounding the cysts the calcium content was found to be from two to three times greater than that in the blood serum.

The authors report also two experiments on dogs in which segments of the fibula were removed and transplants of bladder mucosa were made. Bony continuity was established at the end of two and a half months.

NATHAN A. WOMACK, M.D.

Jung, A. and Cemil, S. Experiments on Heterotopic Ossification in the Spleen (Quelques expériences sur l'ossification hétérotopique dans la rate). *Presse méd.*, Par., 1935, 43, 40.

The authors have confirmed the observations of others regarding the heteroplastic formation of bone in the spleen under experimental conditions. They found, for instance, that when the mucous membrane of the urinary bladder is transplanted into the spleen with a strip of aponeurosis, bone is formed after one

or two months in the connective tissue medull in contact with the bladder mucosa that has proliferated with the formation of cysts. They have found also, as has been noted by others, that the transplantation of either the bladder mucosa or the aponeurosis alone into the spleen does not lead to new bone formation. When the peroneus was transplanted with the bladder mucosa was first boded the bone formation as also in appearance, irregular and less abundant. When normal aponeurosis was transplanted with boded bladder in case new bone formation did not occur. The authors contend that the amount of calcium in the fluid of the young cysts is the same as that in the blood of the animal.

N. THOMAS A. WRIGHT, M.D.

Nicholson, G. W. Studies on Tumor Formation. XV. A F. Uterine Ovarian Teratoma. *Gyn. Hosp. Rep. Lond.* 934, 24, 350.

The author presents a detailed description and an attempt at analysis of a museum specimen of testiform ovarian teratoma that was first described by Shetlock in 1904. In the earlier report the specimen was described as the trunk of a sexually mature woman with vulva, perineal raphe, pubic hair, one upper and two symmetrical lower extremities, rudimentary vertebral column, and a colonic cavity containing a loop of intestine. In the examination reported here the specimen has been treated simply as an unknown object composed of human flesh.

The following questions were in the mind of the investigator during the study of this tumor: Is the teratoma fetus, that is, tumor of a human organism? Is it merely testiform? Before proceeding with an analysis of the tumor tissue in an attempt to answer these questions the author enumerates some of the theories of teratogenesis. In attempting to explain the problem as one of parthenogenesis he points out that of the multitudes of ovarian and solid teratomata that have been well described, only fifteen resembled the human form closely enough to be called testiform and of the latter only two contained bones that could be regarded reasonably as vertebrate. If teratomata represent parthenogenetic ova one would expect to find as a general rule some sure traces of membranes and placenta, of longitudinal axis, of metameric segmentation, and of orderly delamination of the germinal layers. In the face of authority we cannot very well believe that an ovarian teratoma represents either a parthenogenetic or other attempt at embryonic formation.

The assumption of the locustuous fertilization of an ova of the host by her father at the time or as a consequence of her own conception were better never made.

What are the claims of the blastomere theory which holds the field today? Cell rests in the form of accessory organs, dislocations, and tissue malformations are common. Invariably they are either fully differentiated or at least, show every sign of every attempt at physiological differentiation possible in their strange location and under trying con-

ditions. The author has never found persistence of cell rests in the embryonic state. Moreover the transplantation experiments of Spezzano, performed with dislocated blastomeres, show that the fate of the blastomeres is determined by the position they happen to occupy in the body. When a blastomere is dislocated into the region of the developing nephros it takes its physiological share in the formation of that organ and of the Wolffian duct. The evidence seems to justify the inference that if blastomeres is displaced into the region of a developing ovary it will take part in the formation of the cells of that organ. That is to say it may reasonably be assumed to produce normal ovarian stroma, blood vessels, ovarian follicles, and normal ovaries. There is nothing to suggest that it will attempt the formation of a second individual, fetus or even the most rudimentary teratomatous sort. The evidence of modern biology does not support the notion that displaced blastomere will produce an ovarian testiform dermoid or teratoma adultum.

The author believes that the development of our knowledge regarding the cause of teratomata remains for the future. Until such development occurs we must rest content with the idea that the germ or mother-cell will be shown to be either (1) cell or group of cells with an antecedent anomaly of composition or location, or (2) normal cell or group of normal cells reacting abnormally in abnormal conditions. In the study hereof reported the author attempted chiefly to determine whether or not teratomata, the genesis and development of which are unknown, represent attempts at the formation of human organisms. He therefore feels justified in denying attributes of fetus to the object described as he found no internal evidence of testiformity. The object presents no traces of membranes nor of placenta. Most important is the demonstration that the central axial skeleton is not a vertebral skeleton since it is built of centers of ossification in a single unsegmented cartilage.

The object is distinguished from ordinary dermoids and amorphous teratomata chiefly by its marked bilateral symmetry of outer form and inner structure. The author interprets this phenomenon in terms of a figure of equilibrium known as an "adductoid" as the physiological reaction of fluid or semi fluid matter to elementary physical principles of fluid pressure. There is also the action of physical stimuli in the form of the appendages, particularly the paired so-called legs or extremities. By and the effects of moulding by fluid pressure, these appendages present no characteristics, gross or histological, of somatic lower limbs. The cutaneous fold-like ridges bordering the roots of the subcapillary appendages is about homologous in the human body. It is to be interpreted as a local reaction to physical conditions. Its presence strengthens the view of physical causation of the outer form of the dermoid nodule and its appendages and much of its inner structure. The vulva represents an orifice peculiar to dermoids generally known as the "mouth" and is like it



homologue in the human body. No pubic region is found, hence there is no evidence for pubic hair and sex, and there is no evidence of sexual maturity of the dermoid nipple. There are no signs of present development, and the tissues are as fully differentiated as those of an adult human being. The name "fetus" is quite inapplicable to the object. The object presents no more internal evidence of a human body than the most amorphous teratoma.

In summarizing, the author states that a "germ" very much simpler than a parthenogenetic ovum or early blastomere satisfies the requirements of formal genesis. When basing explanations of causal genesis upon the demonstrations of contemporary experimental embryology we may dispense with a pathological "germ" in the sense of antecedent isolation, displacement, or malformation of a mother-cell or cell group, blastomere, or ovum. We owe this dispensation in the first place to Budde, who refers the pathological factor in teratogeny outside the affected region altogether by assuming a disturbance of continuity of the primitive streak. Budde bases this assumption on Spemann's transplantation experiments with fragments of the dorsal lip of the blastopore which is the organizer for somatic development. The results of this disturbance of continuity of the primitive streak will be one or more small isolated, dislocated, or displaced secondary organizers, the effects of which will vary with their own innate organizing capacity, the time of the disturbance, the consequent development already undergone by the ovum, and the region upon which the fragment happens to act. However, the effects of its action will never be perfect, that is to say, an embryo, because (1) they are overshadowed and interfered with by the activity of the great organizer of which it is a mere fragment, and (2) the cells upon which the secondary organizer acts were no longer quite indifferent at the beginning of its action. Nevertheless, as part of the physiological organizer, the action of the fragment will be in directions as somatic as possible under the circumstances and, with the result, called a "teratoma," will be physiological forms of development and growth.

Finally, the teratoma is conceived of as the physiological reaction of a perfectly normal indifferent cell—more strictly, of the perfectly normal indifferent cells—of the part to ambient conditions, the only abnormality of which is a disturbance of an entirely physiological principle. It has been shown quite recently that the action of the organizer is not vital and cellular since many animal tissues which possess no organizing action when alive will unfold it after death. Moreover, adult tissues, living or dead, or their heat coagulated cell-free extracts have this action confined strictly to the dorsal lip of the blastopore in the developing ovum. It would seem, therefore, that the inductive effect of the organizer is due to some chemical substance elaborated by it. We can replace the conception of the material breach of continuity in the young embryo by a disturbance of metabolism in our attempts to find an explanation

for the cause of teratomata. The author concludes that modern ideas supported by recent experiment do much to shake the foundations of the following two dogmas of pathology: (1) that displaced embryonic cell rests or antecedent anomalies of the mother-cell or cells will explain tumor formation and the tumor can be explained only as a physiological reaction to abnormal stimuli, and (2) that our discipline is concerned with unnatural, unbiological, or unphysiological principles. HERBERT F. THURSTON, M.D.

Macklin, M. T. Heredity in Cancer and Its Value as an Aid in Early Diagnosis. *Edinburgh M. J.*, 1935, 42: 49.

Cancer of a specific type in a specific organ at a specific age tends to occur in families and is therefore hereditary. In a series of families selected because two members of each had died of the same type of tumor, it was found that blood relatives were affected ten times as often as unrelated persons.

Chronic irritation appears to hasten a reaction which, in its absence, will occur at a later date. In some cases it is not a factor at all.

The hereditary character of cancer favors early diagnosis. While a patient cannot be periodically examined for all types of tumor, he may be examined at intervals for the type or types of tumor which have been most common in the other members of his family. GEORGE A. COLLETT, M.D.

Umezawa, R. Melanocyte Reaction of the Preparations of the Pituitary Body and the Urine of a Cancer Patient. *Jap. J. Obst. & Gynec.*, 1935, 18: 2.

Melanin granules are found in melanocytes present in the skin of amphibia and pisces. Under the influence of certain biological products such as pituitary extract and the effect of drugs or physical impulses, these granules, which normally are arranged in massive groups, become scattered. The skin then assumes a chocolate or brownish black hue, a phenomenon called the "melanocyte reaction." The exact site of production of the melanocyte hormone in the hypophysis is unknown.

The author reports experiments which he carried out chiefly on male *Rana nigromaculata* tadpoles weighing from 20 to 30 gm. Injections were made under the skin in the lumbar region. If the reaction was positive, the dorsal region became dark within a few minutes after the injection. Morphological changes of melanocytes in the web membrane were studied with a capillary microscope.

The melanocyte reaction after the injection of urine of pregnant women was positive in the majority of cases. It could be intensified by boiling the urine for one minute. The urine of women with hyperemesis gravidarum, hydatidiform mole, chorionepithelioma, or eclampsia gave a markedly positive reaction.

The urine of women with gynecological diseases such as endometritis, cervical erosion, and pelvic peritonitis gave a negative reaction. Saline extracts

of uterine myoma or cancer the cerebrospinal fluid of women with uterine cancer, and preparations of follicular hormone gave negative results. On the other hand, positive reactions were obtained with the urine of women suffering from cancer of the uterus and with various commercial preparations of the anterior and posterior lobes of the pituitary gland.

The author concludes that cancer carries excrete the melanocyte hormone with the urine. Apparently there is an intimate relationship between the pituitary secretion and that of persons with cancer. In patients with cervical cancer subjected to roentgen therapy the urine which first gave positive reaction temporarily became negative as soon as clinical improvement was noticed. The intensity of the reaction varied according to the location of the cancer. It was greatest in cases of cancer of the cervix, external genital organs, and rectum.

If factors liable to cause a positive reaction, e.g. pregnancy, are taken into consideration, the reaction is of value for a rapid diagnosis of cancer. It requires only from fifteen to sixty minutes.

JOSEPH K. NARAY, M.D.

Bracco, R. New Studies on Latent Pathological Microbes in Tissues Removed from the More Common Operative Fields. (*Nuove ricerche sui microorganismi latenti patologici nei tessuti prelevati da alcuni dei più comuni campi operativi*). *Chir.* 1934. 2.

Bracco reports a bacteriological study he made in the General Surgical Clinic of the Royal University of Turin (Director: Uffreduzzi) to determine how infections arise and spread in the abdominal viscera. Of seventy-seven cases of chronic appendicitis, the macro-appendix was found free from bacteria in thirty (38 per cent). Of the remaining forty-seven cases, the colon bacillus was isolated in twenty-three, the staphylococcus pyogenes aureus in seven, the staphylococcus pyogenes albus in six, the enterococcus in seven, streptococcus in one, the micrococcus catarrhalis in one, the micrococcus tetragenes in one, and diplococcus in one. Four of the cases with bacteria presented lesions consisting of small foci of small-cell infiltration which were usually perivascular and slight vascular lesions consisting chiefly of hypertrophy of the intima of the small arteries.

Bracco concludes that, of the forty-seven cases with positive bacteriological findings, forty-three may be considered cases of physiological latency as they presented no histological lesions, and four as cases of pathological latency as the inflammatory lesions were small and chronic probably because of reduction of the metabolism of the bacteria or the liberation of small quantities of endotoxins by death of the organisms.

Of the bacteria isolated in this study, 59.8 per cent belonged to the bacillus coli group. The staphylococcus aureus and the enterococcus each constituted 9 per cent, the staphylococcus albus, 8 per cent, the micrococcus tetragenes, the streptococcus,

and the micrococcus catarrhalis, each per cent, and the diplococcus, 1.8 per cent.

In three of the four cases of relative pathological latency the condition was due to the bacillus coli, and in one to the staphylococcus pyogenes aureus. Of eight cases in which the perimetrium was studied following hysterectomy for uterine tumor the findings were negative in four, the staphylococcus albus was discovered in three, and the staphylococcus aureus was discovered in one. One histological study showed chronic inflammation with lymphocytic infiltration.

EDOUARD T. LACROIX, M.D.

Gordon Taylor, O. Bad Surgical Risk. *Brit. M. J.* 1934. 1555.

By the term "bad surgical risk" the author means the patient rather than the operation. He states that the "bad surgical risk" has been aptly defined by Rooks as "a type of patient whose prospect of recovery from active surgical treatment of his condition falls much below the average. Surgical risk to the patient depends upon race, sex, heredity, bodily conformation (fat, color of hair, etc.), previous habits and mode of life, antecedent or intercurrent disease, the state of the cardiovascular, respiratory, urinary, and nervous systems, psychological conditions, the nature and severity of the condition for which surgery is contemplated, the presence or absence of secondary phenomena affecting the patient adversely, and the type of operation proposed.

Extirpation of the rectum by combined methods is better borne by women than by men. Gastric resection is followed by anemia in females more than in males. Operations, particularly radical breast operations, are poorly borne during menstruation, pregnancy and parturition. Of great importance in reducing surgical risk is the family history of longevity. The risk is lowest during the years that the patient is in his prime and when operation is done promptly after an early diagnosis and under the correct type of anesthesia properly induced. Whenever complicated surgical procedure is under consideration the adage, "A man is as old as his arteries" must be kept in mind. Persons whose stature and form are abnormal are abnormal surgical risks. Fat is a well-known surgical handicap. In the cases of obese patients operation is technically difficult and fat is usually present not only around but also within the thorax. Fat persons appear to be more prone to thrombosis and embolism and less resistant to infection than thin persons. Confinement is bad for a few days before operation may be a most salutary preliminary measure. Persons addicted to excessive use of alcohol, tobacco or drugs are poorer surgical risks than others.

Antecedent or intercurrent disease may prejudice the chances of successful operation. The risk is increased especially by cardiovascular disease and degeneration. Arteriosclerosis and calcification of vessels combined with fat in Jewish patients with growth in the colon call for the Mikulicz type of resection. Cooperation with a good internist is of

great aid in the pre-operative treatment. Low blood pressure is a more serious handicap to surgery than hypertension. In diabetes, the risks of surgery have become negligible since insulin and glucose therapy have been employed before operation. The cause of death in fatal cases is senility, not hyperglycemia. Renal disease and antecedent infections such as erysipelas, tetanus, and pyogenic infection constitute added risks. With regard to psychological factors in the danger of operation the author states that it is wise to refrain from all operations of convenience in the cases of patients who require much persuasion and show evidences of mental unrest.

In cases of thyrotoxicosis the risk of surgery has been decreased by the pre operative administration of iodine and repeated determinations of the basal metabolic rate during the pre operative period of rest in bed. However, operation is contra-indicated under the following circumstances:

- 1 When the patient has been receiving indiscriminate doses of iodine for months or years prior to seeing the surgeon, the basal metabolic rate is above +40, tachycardia is present, and there has been a marked loss of weight.
- 2 When, on being given iodine by the surgeon preparatory to operation, the patient becomes clinically worse and the basal metabolic rate rises.
- 3 When the operation has been delayed too long after the administration of iodine, iodine has lost its effect, and the basal metabolic rate rises.
- 4 When an acute infection such as tonsillitis, is present.
- 5 When the patient shows mental disturbances.
- 6 When the patient shows an idiosyncrasy to iodides.

In spite of the current belief to the contrary, operation is not contra indicated by congestive or anginal heart failure, auricular fibrillation or flutter, hypertension, or extreme youth or old age.

Increased experience with radium therapy has changed the attitude that existed formerly as regards surgery of the tongue and mouth. Whatever views may be held as to the best method of treating cases of neoplasm of the anterior half of the tongue which are good surgical risks, radium therapy is probably better than surgical extirpation and has a lower mortality than more drastic procedures in cases of neoplasm of the posterior portion.

In cases of peptic ulcer, ill advised, ill timed, or inappropriate surgery may convert a good risk into a poor risk. There is no single form of operative procedure which is applicable to every case. By surgical judgment or the lack of it the patient's cause may be won or lost. In cases which are poor risks the simplest, most gentle, and most rapid procedure is the method of election. The position, size, and fixity of the ulcer, the possibility of malignancy, and the findings of functional gastric analysis must be considered. A patient with a chronic peptic ulcer may be rendered a poor surgical risk by ill-judged and indiscriminate surgery, but he is already both a poor surgical and a poor medical risk when he has bled

from the ulcer and he becomes a greater risk with each succeeding hæmorrhage. It is logical to assume that operation is required before a second hæmorrhage takes place and that surgery is the safest procedure. The possessor of an anastomotic ulcer is a poor risk. A gastrojejunal or jejunal ulcer may be a severe burden, but an added communication with the colon increases the duration of the operation to cure it and a complicating hæmorrhage makes the risk greater than ever. All cases of gastric cancers are poor surgical risks.

The danger of postoperative thrombosis in cases of splenic anæmia with a high initial blood plate count is perhaps not always sufficiently appreciated. When splenectomy is contemplated for this condition the services of a competent hæmatologist are of great importance.

Percentage mortality is dependent upon the risk. Colectomy for carcinoma of the colon is unfavorable because of the operative mortality. In cases of carcinoma of the rectum many types of operation are performed, but the most important factor is the judgment of the surgeon.

Surgery of the bile ducts is associated with a much greater risk to life than surgery of the gall bladder. Operation should be deferred until the jaundice begins to subside. Blood transfusion is better than the intravenous administration of calcium chloride as a means of diminishing or preventing the tendency toward hæmorrhage and is especially valuable when the bilirubin curve begins to rise. The administration of large quantities of glucose before and after operation is essential. In cases of marked jaundice nothing more than drainage should be attempted.

A patient requiring prostatectomy is a poor surgical risk when the blood urea is over 60 mgm per 100 c cm and when, though the blood urea is normal, there is evidence of moderate renal impairment.

ALTON OCHSNER, M D

Rueckert, W. The Cause of Death in Fat Embolism (Zur Frage der Todesursache bei Fettembohe) *Deutsche Ztschr f Chir*, 1934, 243 537

A pulmonary and a cerebral fat embolism are recognized. In the former there is a mechanical disturbance due to a superabundance of fat in the lungs and death results from suffocation. In the latter there are disturbances of the brain manifested by Cheyne-Stokes respiration due to paralysis of the respiratory centers which, in the beginning, are frequently accompanied by sleepiness, muscle-twitchings, and violent cramps. The picture is similar to that of retention uræmia. Even the maximal contraction of the pupils characteristic of uræmia frequently occurs.

Cases in which associated renal injuries were demonstrated have been reported (Paul and Windholz, Dusie). The theory was advanced that the uræmic symptoms were concealed by the cerebral fat embolism. This theory was disputed by Melchior and Groendahl, but supported by the residual nitrogen determinations made by Paul and Windholz in

experiments on animals. Welch and Trautman opposed it. Ruckert therefore made determinations of the residual nitrogen by the Kjeldahl macro-method in experiments on ten rabbits and three dogs.

He found that prolonged intra-cranial injections of from 0.25 to 1 c.c.m. of fat produced an insignificant transitory increase in the residual nitrogen. A sudden increase in the amount of fat injected, 4 to 5 c.c.m. rapidly increased the residual nitrogen and caused death in three days. (It is typical symptoms of uræmia and cerebral fat embolism.) Injections of fat into the renal arteries of dogs caused a transitory increase in the residual nitrogen. Bulk amounts of 4 c.c.m. produced a rapid increase in the level found in fatal uræmia. The fat of bone marrow and liquid paraffin produced similar results.

He is therefore drawn no practical conclusions from his experiments at this time as determinations of the residual nitrogen in cases of illness are lacking. However he calls attention to the fact that the average duration of cerebral fat embolism until death is from eight to eleven days.

(Faint) *Abstract of SURGERY M.D.*

#### GENERAL BACTERIAL, PROTOZOAN AND PARASITIC INFECTIONS

Ovary, F., and Le Barre, L. Chronic Staphylococcal Septicopyæmia with Prolonged Course (Les septicopyémies chroniques staphylococciques chroniques à évolution prolongée). *Presse méd. Par.* 1935, 43.

The authors review briefly the classifications of staphylococcal infections that have appeared in the French literature. They regard as most satisfactory the classification of Lemierre, viz. (1) fulminating acute type, which is usually fatal; (2) a subacute type, in which the prognosis is less unfavorable; and (3) chronic type characterized by successive and multiple localizations. In their discussion of the chronic type, the subject of this article, they report the case of a patient who first presented a lesion at the nose and later developed secondary lesions in the lungs, bones, joints, and subcutaneous tissues. This patient was under their observation for six years. The 15 abscesses were treated conservatively while the other lesions were drained surgically. When last seen, the patient was apparently cured. Several cases of this type collected from the literature are discussed briefly.

The condition is most common in young adult males, probably because they are most exposed to trauma and skin infections. The portal of entry is usually the skin or a bone. As a rule the initial lesion heals rapidly and there is a free interval before the appearance of the septicopyæmia. The authors emphasize the pyogenic nature of the organism and the frequency of its occurrence in the debilitated and the diabetic. The prognosis depends to a great degree upon the site of localization of the secondary lesions. A positive blood culture is an unfavorable sign. Treatment is unsatisfactory. It consists

chiefly of drainage of the localized infections. Here this is possible and measures to increase the patient's general resistance. *Nature*, 1, 1936, 11 D.

#### DUCTLESS GLANDS

Tabanelli, M.: Investigations on the Relation Between the Sympathetic Nervous System, the Blood Calcium, and the Parathyroids (Ricerche sul rapporto fra simpatismo, calcemia, paratiroidi). *Arch. ital. di chir.* 1934, 35, 83.

The author attempted to determine the relations between the sympathetic nervous system, the parathyroids, and the calcium content of the blood by means of animal experiments and clinical observations. 1. Experiments on dogs, complete parathyroidectomy performed in various sites, including the common carotid, the carotid sheath, and the femoral artery caused no change in the calcium content of the blood. After the resection of tracts of the mesenteric, omental, and femoral arteries 4 or 5 cm. long. (It is consequent interruption of the parasympathetic branches.) the calcium content of the blood decreased, reaching its lowest level from one to three days after the operation, and then returned to normal in from four to ten days. After resection of the left great splanchnic nerve immediately below the diaphragm the calcium content of the blood showed a decrease which began ten to four hours after the operation and reached its maximum between the third and fifth days and then returned to normal by the eleventh or twelfth day.

The clinical investigations, though carried on as far as possible under the same conditions as the experimental investigations, yielded less definite findings. The sympathetic nervous system is injured during various operations at different sites, including strumectomy. Its manipulation and ligation of the vessels, excision and amputation of the stomach, and resection of portions of arteries. These operations were followed by only slight variations in the blood calcium, all of which were within the limits of normal.

Bassini and Dogliotti have claimed that hypercalcemia occurs in various pathological conditions, including hypertension, scleroderma, and diabetes as the result of hyperfunction of the parathyroids brought about by predominance of the action of the sympathetic over that of the vagus. The author found only slight variations in the blood calcium in these conditions.

He ever his experiments show that effects heretofore considered solely those of parathyroidectomy can be brought about to a lesser degree by operation on the autonomic nervous system even at a distance from the neck. The question arises whether these effects are brought about by an action exerted on the parathyroids through the sympathetic nervous system or by the direct action of the sympathetic nervous system itself. Tabanelli believes that the parathyroids are involved in their production as these glands seem to be almost the sole regulators of calcium metabolism. *Arch. e. Chir. M. med.*, 11

Calef, C. The Influence of the Prostatic Hormone on the Formation of Bony Callus (*L'influenza dell'ormone prostatico sulla formazione del callo osseo*) *Polichin*, Rome, 1934, 41 sez chir 647

In recent years numerous investigations have shown that the various glands of internal secretion are of importance in stimulating repair in certain tissues, especially bone, through their hormones

Although up to the present time the existence of a prostatic hormone in internal secretion has not been demonstrated, it seems to the author that experimental work has indicated the presence of such a hormone. The investigation herewith reported was undertaken to determine whether callus formation is stimulated by a hormone from the prostate

Following a review of the literature on bone repair and the probability of the existence of a prostatic hormone, the author reports two series of experiments which he performed on guinea pigs and dogs

The first series of his experiments were carried out on sixteen male guinea pigs which were divided into two groups. In the animals of the first group a simple fracture of the middle third of the ulna was produced by the open method. In those of the second group resection of 4 mm. of the middle third of the ulna was done. The animals were all of the same age and of about the same weight, and were kept under similar conditions. There was no immobilization. Three days after the operation in each group injections into the site of fracture or resection were started. In the cases of some of the animals extract of prostate furnished by the Serrero Serotherapeutic Institute was injected. In the cases of the others, which

served as controls, distilled water was used. The injections were made every four days and the animals kept under observation for fifteen, thirty, forty-five, and sixty days. At the end of the experimental period roentgenograms were made and microscopic sections of the specimen were prepared

The second series of the author's experiments consisted of twenty-four experiments carried out on eight male dogs at the age of prostatic function. Four of the dogs were prostatectomized. The hypogastric prostatectomy had been done and the wound had been long healed before the bone lesion was produced. A fracture was produced in the fibula, the tibia being left intact, and resection of 6 mm. was done in the ulna, the radius being left intact. There was no immobilization. One group of dogs with a fracture and one group subjected to resection were given no treatment after the bone injury and another group of each were treated with prostatic extract. The administration of the prostatic extract, endoprostatina from the Serotherapeutic Institute of Milan, was begun immediately after the bone operations and repeated daily until the end of the experiment. The extract was given in pastilles

The article contains roentgenograms and histological sections made in all of the experiments

The author concludes that there is a prostatic hormone which very definitely influences the formation of callus after bone fracture or injury, and that in the experiments he reports it exerted such an effect whether it was injected at the site of the lesion or given by way of the gastro intestinal tract

BARBARA B. STIMSON, M.D.

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# SUBJECT INDEX

- ABDOMEN**, Acute inflammatory conditions of mesenteric fever 114, 240; carriage of heterotopic teeth in 12; tubercula of anterior wall of 13; functional derangement of intestines following operation on 35; defects of wall of, following appendectomy 321; congenital and ruptures of small intestine in closed injuries of 32; painful conditions of in childhood, 323; anatomical changes in liver in various syndromes of 323; side of 333.
- Abdominal**, Pathological conditions of, 402.
- Abortion**, Habitual, 432, relation between parity and pathological conditions, 433; clinical and preventive in treatment of habitual 433, due to psychic trauma, 543.
- Abcesses**, Time for operation on 20. See also names of organs.
- Adrenalectomy**, Transplantation of adrenal cortex for 235.
- Adrenal**, See suprarenal.
- Adrenalin**, Possibilities of local injury to tissues from injections of and solutions containing 167.
- Agar**, Culture of, Quantitative histological studies of normal and pathological bone marrow 33; states of inhibition of bone marrow and 161; etiology and treatment of 473.
- Air embolism**, Surgical importance of 71.
- Albers-Schönberg**, disease 443.
- Alcohol**, Relief of intractable pain by intraspinal injection of 4; injection of into spinal nerves in treatment of diabetes mellitus 53.
- Leukemia**, Associated with pregnancy 123, and states of inhibition of bone marrow 161.
- Allergy**, And sympathetic ophthalmia 98, catgut 473.
- Alveolar echinococcus**, Intermediate and transitional pathological forms between hydatid echinococcus and 267.
- Anaesthesia**, in eclampsia, 541.
- Anemia**, Quantitative histological studies of bone marrow in, 55; severe puerperal 125.
- Anesthesia**, Obstetrical, induced with evipan sodium 43; advantages of intravenous evipan, in ophthalmic surgery, 93; cyclopropane, 152; dangers and injuries from local 152; avertin in pre-anesthetic medication, 259; technique of intratracheal 259; factors other than anesthetics affecting, 259; general reactions of body to ether inhalation, 365; new German evipan sodium 363; general, induced with evipan sodium 366; short intravenous, induced with evipan sodium, 366; subarachnoid, 367; clinical observations on use of evipan, 463; use and abuse of spinal, 502; behavior of certain reflexes of periosteal and articular origin in surgical 56.
- Angra pectoris**, Total thyroidectomy for, 90 197.
- Ankle**, Arthrodesis of posterior inferior in treatment of severe malformations of foot 214; treatment of sprained 321; treatment of malunion of 557.
- Antrum of Highmore**, Chronic pyogenic inflammation of, 509.
- Anus**, Achalasia of, and megacolon 221; surgical anatomy of, 330.
- Apycolysis** in pulmonary tuberculosis 314.
- Appendectomy**, Abdominal wall defects following, 329; appendiceal fistula following, 423.
- Appendicitis**, Errors of surgical diagnosis in, 62, and acute inflammatory abdominal conditions in scarlet fever 114; deaths from 114, acute, 2-0, 5-0, 539, in gynecology, 250; indications for early operation, 2-0; etiology of 329; management of perforated, 329; hematoma in, 309; value of negative exploratory puncture in suppurative, 4-3; acute in children, 529 531; acute tuberculous 530.
- Appendix**, Peridiverticulitis originating in, 35; diverticula of 35.
- Arachnoid**, Anatomosis of ureter to in treatment of hydrocephalus 201.
- Arm**, Roentgen therapy of vasomotor disturbances of extremities, 143; classification, etiology and differential diagnosis of lymphedema of extremities, 160; cause and treatment of tennis 551.
- Arteries**, Gangrene of fingers and toes in polyarteritis nodo 114; surgical treatment of hypertension in, 111; results of arteriography in diseases of, 360; passive vascular exercises in obliterative diseases of peripheral by rhythmic alternation of environmental pressure 361; etiology, clinical findings and treatment in arteritis obliterans 361; internal topography of of kidney and renal pelvis of human beings and domestic animals 442; arteriovenous anastomoses 456; role of nutrition of long bones in formation of callus and calcification of medullary cavity, 553.
- Arteriography**, Importance of intracranial pressure in circulatory conditions of brain in 98; results of, in diseases of arteries and tumors 360; diagnosis of meningitis injuries by 452; information obtained by, in vascular diseases of extremities 457; critical study of 538; dangers of 538.
- Arteriosclerosis**, Conservative treatment of peripheral vascular diseases due to 144.
- Arteriovenous anastomoses**, 456.
- Arteritis**, Information obtained by arteriography in, 457.
- Artery**, Ligation of carotid in treatment of pulsating exophthalmos 207.
- Arthritis**, Pathogenesis, clinical aspects and treatment of, in hamophilus 50; chronic proliferative in patients with rheumatic fever 445; orthopedic and physical therapeutic treatment of chronic 445; periarticular injections of novocain in management of traumatic, 550. See also names of joints.
- Arthroscopy** of knee joint 52.
- Artificial pneumothorax**, Thoracoplasty versus in treatment of pulmonary tuberculosis 207, in lung abscess 314; in treatment of pulmonary tuberculosis, 314.
- Aschheim Zondek**, test; errors inherent in pregnancy tests based on 341.
- Astralectomy**, Static conditions of foot after, 141.
- Atlas**, Subacute suppurative osteomyelitis of, 352.
- Auditory nerve**, Diagnostic factors concerning herpes zoster of 102.
- Autonephrectomy**, Nephrectomy versus in renal tuberculosis 545.
- Autonomic nervous system**, Relation of, to carbohydrate metabolism, 166.
- Avertin** in pre-anesthetic medication, 259.
- Avulsion**, Burn contractures of, 58.
- Axillary vein**, Traumatic thrombosis of right, 54.
- BACTERIA**, Significance of, in surgical infections, 257; action of anaerobic and aerobic, on surviving small intestine of rabbit, 476; influence of hormones of





- plastic repair of, 206, relationship of so-called umbilical adenomata to apocrine sweat glands and adenofibrosis of, 212, changes in lungs and pleura following roentgen treatment of cancer of, by prolonged fractional method, 264, diagnosis and treatment of doubtful tumors of, 312, radium therapy in bone metastases from carcinoma of, 370, perithelioma of, 416, Paget's disease of nipple, 416, technique and results of irradiation in carcinoma of, 417, interstitial radium treatment of carcinoma of, 517, relative value of surgery, radium, and roentgen therapy in carcinoma of, 517, diffuse intraduct carcinoma of, 517
- Brecher presentation, Method of dealing with, 439
- Brenner operation for hernia, Comparison of, with Bassini, Hackenbruch Druener, Schmieden, and Kirschner operations, 322
- Broesicke's hernia, 534
- Bronchi, Reaction of lung tissue of rabbits with organic foreign bodies in, 106, surgical treatment of carcinoma of, 108, serial bronchography in early diagnosis of carcinoma of, 315, carcinoma of, 316, topographic classification of primary cancer of lung, 316, classification of carcinomata of, in relation to treatment and prognosis, 316, lobectomy for carcinoma of lung, 317, total removal of right lung for carcinoma, 318, cancer of, combined with tuberculosis of lung, 518
- Bronchiectasis, Gas cysts of lung and, 107, one stage lobectomy for, 208
- Bronchography, Serial, in early diagnosis of bronchial carcinoma, 315
- Brow presentation, Prognosis and management of, 32
- Buerger's disease, Roentgen therapy in, 143, Etiology, clinical findings, and treatment in, 361
- Burns, Contractures of axilla due to, 58, treatment of, with cod liver-oil ointment, 461, treatment of, 462, cases of, treated in Glasgow Royal Infirmary during past hundred years, 462
- Bursitis, Clinical and roentgen study of chronic, 551
- CÆCUM** Acute diverticulitis of, 34, invagination of haustum of, 35, intestinal intussusception at tumors of, 527
- Casarean section, Twenty four years of conservative low, 42, review of 486 consecutive cases of, at Women's Hospital, Melbourne, 543
- Calcification, In supraspinatus tendon and subacromial bursa, 242, in intestinal tuberculosis, 326
- Calcium, Influence of local excess of, and phosphorus in healing of fractures, 53, behavior of, in bone after total exclusion of bile 222, deposits of, in supraspinatus tendon and subacromial bursa, 242, stream of, as concerned with healing of fractures 245, relation between sympathetic nervous system parathyroids, and, in blood, 572
- Callus, Influence of suprarenals on formation of bony, 349, rôle of nutrient arteries of long bones in formation of, 555, influence of prostatic hormone on formation of bony, 573
- Calmette vaccination, Value of, in prevention of tuberculosis in childhood, 268
- Cancer, Action on certain fermentative processes in tumor tissues of substances causing hypoglycæmia, 104, experimental alteration of malignancy with homologous mammalian tumor material, 105, metastasizing squamous carcinoma, 166, direct demonstration of anti-cancer bodies in serum of animals immune to homologous tumor, 269, statistical results of Roffo's test in 11,000 cases of 270, reasons for failures in roentgen therapy of carcinoma, 309, treatment of, with extremely hard roentgen rays, 564, melanocyte reaction of preparations of pituitary body and urine in cases of, 569, heredity in, and its value as aid in early diagnosis, 569 See also names of organs
- Carbohydrate metabolism, Relation of hypophysis, hypothalamus, and autonomic nervous system to, 166
- Carbon dioxide, Treatment of asphyxia of cerebral cell in traumatic accidents and their vascular complications by subcutaneous injections of, 306
- Carbuncles, Roentgen treatment of, 561
- Carcinoma, See Cancer and names of organs
- Carnofil, a physiological suture material, 261
- Carotid artery Ligation of, in pulsating exophthalmos, 297
- Castration, Effect of, on anterior hypophysis of female rat, 167
- Cataract, Effect of thyroxin on, 298, technique of operation for, 404, subcapsular, in osteomalacia, 507, among the Chinese, 507
- Catgut allergy, 473
- Cavum septi pellucidi, Dilatations of, 411
- Cavum vergæ, Dilatations of, 411
- Check, Radiotherapy of cancer of, 19, treatment of epithelioma of, 405, cancers of, 505
- Chest, See Thorax
- Chlorine, Observations on, in cases of death from high intestinal obstruction, 32
- Cholecystectomy, Duodenal fistula as late sequela of hepaticocholedochostomy and, for stones, 33
- Cholecystitis, Errors in surgical diagnosis, 62, without stone, 223
- Cholecystography, Sources of error in oral, with, 333
- Choledochus, See Bile ducts
- Cholelithiasis, See Gall stones
- Cholesterosis, Experimental production of, 223
- Choline in menstrual cycle and puerperal state, 538
- Chordoma, Sacrococcygeal, 61, 515
- Chordotomy, Late results of, 103, for relief of pain, 471
- Chorionepithelioma, Extragenital in male with positive anterior pituitary lobe reaction, 62
- Chromocystoscopy with phenolsulphonphthalein in diagnosis of kidney function, 131
- Clawfoot, Etiology and results of treatment of, by anterior tarsal resection, 554
- Cleft palate, "Push back operation" in, 405
- Clitoris, Malignant melanotic tumor of, 540
- Club-foot, 355, arthrodesis of posterior inferior ankle joint in, 244, cases of congenital, observed at Rizzoli Orthopedic Institute in period from 1899 to 1933, 354, congenital convex, 354, talipes equinovarus, 355
- Cod liver oil, Treatment of fresh wounds, burns, and phlegmonous inflammations with, 461
- Cold, Influence of exposure to, on development of shock, 372
- Colibacillosis, Urinary, 447
- Colitis, Roentgen appearance of mucosa in, 328
- Collective review Gastroduodenal ulcerative disease, a review of the 1933 literature, 1
- Colon, Intercoastal hernia of, of spontaneous origin, 29, malignant tumors of, 33, absorption of dextrose and water by, 159, roentgen appearance of normal mucosa of, 218, anal achalasia and megacolon, 221, anomalies of intestinal rotation as cause of intestinal obstruction, 325, danger of sudden deflation of acutely distended bowel in late low obstruction of, 326, roentgen diagnosis and clinical significance of anomalies of 327, appearance of mucosa of, in pathological conditions 328, pathology and treatment of bleeding polypoid tumors of, 328, transplantation of ileocecal sphincter in anastomosis between small intestine and, 422, in nervous system of distal, 423, cancer of lower, 424

- Colic bacillus, *Haematomas* due to, 37 in urine, 447 pathogenesis and clinical aspects of septicemia due to, 474
- Colostomy, 539, origins and evolution of, 3
- Colposcope in diagnosis of carcinoma of cervix, 426
- Common duct, *See* Bile duct
- Conjunctivitis, Etiological diagnosis of, 305; etiology of inclusion blepharitis, 300; catarrhal diphtheritic, 40
- Cord bladder. Tidal drainage in treatment of, 545
- Corpora cavernosa, Malignant non-carcinomatous tumor primary in, of penis with vascular and osseous metastases, 33
- Corpus luteum, Action of extract of, on uterus of un-anesthetized rabbit, 337
- Coutard roentgen therapy. Modified, 554
- Coxa plana, *See* Osteochondritis deformans juvenalis
- Coxa vara, Congenital, 451
- Craniohypharyngeal, Suprasellar, 3
- Cranium, *See* Skull
- Cryptorchidism, Undescended testes treated with anterior primary-like principle from term of pregnancy 45, 46; and torsion of spermatic cord, 33 malignant growths of undescended testicle, 33 origin of, 35
- Cure in treatment of carcinoma, 37
- Cyclopropane anesthesia, 5
- Cystic duct, *See* Bile duct
- Cystitis, Cystoscopy, Mesonephro-epithelitis caused by, 314
- Cystitis, Cystostomy, Ureterostomy in treatment of peritonitis, after nephrectomy for tuberculous, 347 increased, 445
- Cystitis, Nephroepithelitis, 38
- Cystitis, Nephroepithelitis, 38
- Cystoscopy, Chromocystoscopy with phenololipophilal-ox in diagnosis of kidney function, 31
- Cysts, Filarioid, 37 *See also* names of organs
- DEAFNESS**, Otosclerosis problems, 33 prenatal medication as etiological factor of, in newborn, 301 chronic, in children, 301
- Decapitation, Value of in medical and surgical nephritis, 445
- Dehydration, Treatment of acute and chronic cases of cerebral trans by methods of, 41
- Deltoid muscle, Treatment of permanent paralysis of, 455
- Dental granulations, Intracellular bacteria in, 34
- Dextrose, Absorption of, by small intestine and colon, 30
- Diabetes, Surgical complications of, 373
- Diabetes mellitus, Variations of alimentary glycemia induced by alcoholic injection of splenectomy in, 303
- Diagnosis, Errors of surgical, in first surgical division of Roosevelt Hospital covering period of three years, 63
- Diaphragm, Traumatic laceration of, with hernia of stomach and spleen, 35
- Diaphragmatic hernia, 3, of stomach and spleen after traumatic laceration of diaphragm, 30, of large intestine of spontaneous origin, 30, through right dome of diaphragm, 52 at oesophageal hiatus with short oesophagus and thoracic stomach, 521 incidence and significance of hiatus hernia in pregnant women, 323
- Dilatation, In treatment of retinal detachments, of principles, application, and results of short wave, 370 hyperthermia caused by short-wave, 37 in treatment of malignant disease of upper jaw 401 cures of retinal detachment presenting certain unusual features after operation by surface, 404, short-wave, and its use in surgery 456, painful conditions of brachiocephalic region and their treatment with physical agents, 55; short-wave, 385
- Diphtheria, Modern surgery in, 3, catarrhal diphtheritic conjunctivitis, 401
- Disease, Gen's, 185; Scurvy, 67 transplantation of adrenal cortex for Addison's, 35, treatment of Warhol's with "sarcoplastic", 349, cause of failure of operations for Raynaud's, 440; relation of typical Hodgkin's, to infection and neoplasia, 5 185; case not viral in Hodgkin's, 52; chronic congestive splenomegaly and its relationship to Banti's, 313, O'Brien's, 320, Brown's, of palate and fauces, 403; Paget's, of nipple, 416 treatment of Hodgkin's, by Ilsebach's method of continuous irradiation of entire body 408
- Drop, Therapeutics of intravenous, 350
- Duodenitis, Collective review of 1933 literature on operative disease of, 34, as its sequelae of hepatocholecystitis and cholecystitis for stones, 35, errors in surgical diagnosis, 61 diverticula of, 317 time of operation for ulcer of, 370 unstable or irritable, 48; nature and treatment of peptic ulcer of, 313; surgery in treatment of peptic ulcer of, 345
- Dura, Unilateral anastomosis in treatment of hydrocephalus, 303 Surgical management of chronic subdural hematomas, 33
- Dyscholeprolaxis, Clinical, roentgenological, and histological picture of, 40, of O'Brien, 350
- Dysenteria, Indications for prophylaxis, 433
- EAR**, Macropurulent tubotympanic infections, 18, forced drainage for treatment of mastitis secondary to infection of, 18; otosclerosis problems, 33, prenatal medication as possible etiological factor of deafness in newborn, 301 results of treatment of malignant tumors of, 303; therapeutic use of concentrated streptococcus serum of New York State Department of Health in infections of, 400; window operation for bone tumors of, and perichondritis with effusion, 304
- Echinococci, Intermediate and transsexual pathological lesions between hydatid, and alveolar in man, 307
- Eclampsia, Death from, 36 relation between ptery and pathological obstetrics, 34, blood chemistry in, 347 occurrence of, in Denmark during years 1918-27 437 streptococci in, 347 treated by modified Streptococcal method, 347
- Ectopic pregnancy 433
- Elbow, Cause and treatment of tennis arm, 51 hyponatremia of apophyseal and bicipital bursa containing rice bodies, 33
- Electrocoagulation, Comparative effects of various high-frequency currents and of thermal cauterization in prostatic resection, 39
- Embolia, Pulmonary, as complication of trauma, 344 pulmonary following surgical operations, 48, surgical importance of air and fat, 37 thrombosis of deep veins of lower leg causing pulmonary 343; problem of pulmonary 450, pulmonary 34 cause of death in fat, 37
- Empyema, Time for operation for, 370, paired, due to anaerobic streptococci, 48
- Encephalitis caused by cytoblasts cellulosus, 314
- Encephalography, In children, 301 changes in sella turcica and shape of interpeduncular cistern shown by pneumopneumal attached to nasal part of sphenoid ridge, 309, significance of abnormally shaped sella turcica cisterns as seen by 414
- Eradication, Abortion, Roentgen therapy in, 343. Etiology, clinical findings, and treatment in, 347 patient's vascular anatomy in treatment of, 34
- Epididymitis as manifestation of orchitis epididymitis, 174
- Epididymitis, Findings in, in functional menstrual disorders, 30, so-called sarcoma of, 318
- Endosteum, Role of, in bone regeneration, 38
- Endothelial sign in obstetrics and gynecology 33

## SUBJECT INDEX

- Enterochromaffin gland, So-called, 217  
 Entropion, Operations for relief of cicatricial, 17  
 Ependymal canal, Roentgenological visualization of, in hydromyelia, 515  
 Epididymis, Aberrant adrenal tissue in 134 extrusion operation for tuberculosis of, 547  
 Epididymitis, Acute, tuberculous, 134  
 Epididymo-orchitis, Acute tuberculous epididymitis and, 134  
 Epigastric hernia, Occult, 110  
 Epinephrin, Effect of, on sympathectomized human extremity, 249  
 Epispadias, Technique for cure of, in women 337  
 Equilibrium, Importance of investigation of, for judgment of old head injuries, 307  
 Ergot, New active principle in, and its effects on uterine motility, 537  
 Ergotamin in obstetrics and gynecology, 437  
 Ether, General reactions of body to anæsthesia induced by inhalation of, 365  
 Eustachian tube, Mucopurulent tubotympanic infections, 18  
 Evipan sodium, Obstetrical anæsthesias induced with 43, advantages of intravenous, anæsthesia in ophthalmic surgery, 93, new German anæsthesia induced with 365, general anæsthesia induced with 366, clinical observations on use of, 463  
 Evisceration, Postoperative, 364  
 Excitement, Postoperative states of, 255  
 Exophthalmic goiter, See Goiter  
 Exophthalmos, Eye complications in exophthalmic goiter 20, physiological considerations in treatment of pul salung, 297, unilateral, 506  
 Eye, Operations for relief of trichiasis and cicatricial entropion, 17, complications in, in exophthalmic goiter 20, advantages of intravenous (evipan) anæsthesia in surgery of, 93, use of thyroxin in, 298, allergy theory of sympathetic ophthalmia, 298, etiology of inclusion blepharitis, 299, meningiomata attached to mesial part of sphenoid ridge with syndrome of unilateral atrophy of, defect in visual field of same and changes in sella turcica and in shape of interpeduncular cistern after encephalography, 309, paralysis of individual muscles of, 402, ophthalmic symptoms in brain abscess, 411  
 Eyelids, Operations for trichiasis and cicatricial entropion, 17, adenocarcinoma of meibomian gland, 301  
 Face, Angiomatosis of, associated with calcifications of brain cortex, 101  
 Face presentation, Spontaneous transformation of, into occiput presentation during period of expulsion 232  
 Facial paralysis, Operative treatment of 310, peripheral, treated by cervical ganglionectomy, 414  
 Fallopian tube, Primary carcinoma of 37, blood transfusion in certain gynecological conditions, 38, sensibility of female internal genital organs 121, temperature and vascular reactions in treatment of inflammatory diseases of female genitalia with heat, 122, matory diseases of gynecology, 230, roentgen therapy in appendicitis in gynecology, 263, thermo-electrical gynecological inflammations, 263, congenital researches in obstetrics and gynecology, 338, congenital ectopia of ovary and, in labium majus, 430, ectopic pregnancy, 435  
 Fat embolism, Surgical importance of, 271, cause of death in, 571  
 Femoral hernia, Prevascular, 212  
 Femur, Anatomicofunctional study of round ligament of 243, sequences of experimental infarction of, in rabbits, 243, fracture of, with luxation of ipsilateral hip, 246, displacements in fractures of neck of, 247, tuberculosis of neck of, 451  
 Fetus, Roentgenological study of mechanism of engagement of head of, 343, rickets of, 549  
 Fibroblastoma, Surgical treatment of mediastinal or intrathoracic perineural, 29  
 Fibroid, Spontaneous rupture of capsule of, 427  
 Fingers, Gangrene of, in polyarteritis nodosa, 144  
 Fistula, Duodenal as late sequelæ of hepaticocholedochostomy and cholecystectomy for stones treated by duodenorrhaphy with omentoplasty, 37, incidence of vaginal in carcinoma of cervix, 37, pancreatic cured by pancreatogastrotomy, 224, of anal canal, 331, pilonidal, 372, postoperative appendiceal, 423, radical relief of vesicovaginal, 538  
 Flank, Advantages of large muscle splitting incision in surgery of, 31  
 Flat foot, 353, variations of skeleton of foot as basis of disorders of, 51, arthrodesis of posterior inferior ankle joint in, 244  
 Food, Influence of deprivation of, on development of shock, 372  
 Foot, Variations of skeleton of, as basis of disorders of, 51, static conditions of, after astraglectomy, 141, roentgen therapy of vasomotor disturbances of extremities, 143, elastic supportive system of human, 244, arthrodesis of posterior inferior ankle joint in treatment of severe malformations of, 244, flat, 353, congenital convex valgus, 354, etiology of claw, 554, treatment of claw by anterior tarsal resection, 554  
 Forceps, Conduct of labor in placenta prævia, with special reference to use of scalp 127  
 Fracture, Unilateral central and annular scotoma produced by callus from, extending into optic canal, 92  
 Fractures, Quantitative study of rate of healing in, 52, influence of healing of, on choice of methods of treatment, 52, influence of local excess of calcium and phosphorus on healing of, 53, rôle of bone marrow and endosteum in bone regeneration, 138, emergency treatment of 141, multiple spontaneous idiopathic symmetrical, 245, calcium stream as concerned with healing of, 245, gangrene following, 246, influence of suprarenals on formation of bony callus, 349, value of modern methods of osteosynthesis by external fixation in cases of adults, 357 See also names of bones  
 Fragilitas ossium tarda, 241  
 Funnel chest, Treatment of, 206, 419  
 Furunculosis, Rôle of organic constitution in evolution and treatment of, 463  
 Gall bladder, Secretion of mucus by epithelial cells of, and experimental production of mucocele, 222, torsion of, 223, experimental production of straw-herry, 223, applied physiology of extrahepatic biliary tract, 332, intramural and interstitial calculi of, 425  
 Gall stones, Provoked elimination of, 116, time of operation for, 270, intramural and interstitial calculi of gall bladder, 425  
 Ganglionectomy, Peripheral facial paralysis treated by cervical, 414  
 Gangrene, Of fingers and toes in polyarteritis nodosa, 144, following fractures, 246  
 Gastrectomy, Technique of partial, 111  
 Gastric juice, Treatment of pyogenic surgical diseases with artificial, 257  
 Gee's disease, 162  
 Genetic activity, Influence of thymectomy on, 340  
 Gland, Intraglandular calcinosis of submaxillary, 89, so-called enterochromaffin, 217, adenocarcinoma of meibomian, 301

- Glands, Healing of osteoplastic transplants of lymph, 246;  
relationship of so-called neoblastic adenomas to  
apocrine sweat, carcinoma of mediastinal, 3  
rare connective tissue tumor in region of Bartholin's  
431
- Glossopharyngeal neuralgia, 414
- Glycemia, Variations of alabaster induced by alcohol's  
injection of splanchones, 301
- Gout, 13 complications in emphysema, 30 hyperty-  
roidism in negro, 30, chemical aspects and treatment of  
stroma anaplasia, histological structure of thyroid  
remaining after cure of Basedow's disease by subtotal  
thyroidectomy, thyrotoxic hypertension, 296  
thyroid surgery as affected by generalized use of  
iodized salt in region of endemic, 97 those of opera-  
tion for, 270, correct and incorrect use of iodine in  
treatment of, 304, operative treatment of hyperpara-  
thyroidism, 374, remission in hyperthyroidism in-  
duced by pregnancy-urine extract, 407
- Gonococci in etiology of inclusion blepharitis, 399
- Gonorrhea, Specificity and behavior of in prostitutes,  
30
- Gonorrhea, Clinical aspects of, in female, 30 specificity  
and behavior of gonorrhea in prostitutes, 30, and  
pregnancy 34 infection in immature vagina, 434  
treatment of, in female, 433
- Gradenigo's syndrome, Oculomotor nerve, spasm in, 308
- Gram-positive, Intracellular bacteria in dental, 94
- Granulopile, 5 quantitative histological studies of  
normal and pathological bone marrow 55
- Grievous disease, See Gout
- Gutta serena, Reaction of blood to, in obstetrics, 138
- Gynecology Blood transfusion in 38 endocervical sign in,  
appendix 10, 30 roentgen therapy of gynecological  
malignancies, 363 thermo-electrical re-  
searches in, 338, ergotism in, 437
- Gynecostoma, 94
- HACKENBRUCH** Dwyer operation for hernia, Com-  
parison of with Bassini, Brancor, Schwenden, and  
Kirschner operations, 313
- Hematuria, Colon bacillus, 57 chaco-operate con-  
siderations on painful nephritis with, 36 in appendicitis,  
139
- Hemoclastic reaction of Jacobus, Determination of liver  
function in toxemia of pregnancy by 456
- Hemolytic shock, Pathologico-anatomical changes in  
organs following, 55
- Hemophilic, Pathogenesis, clinical aspects, and treatment  
of arthritis in, 50 treatment of, with O T 10, 30;  
treatment of, 365 postoperative in sex brothers, 458
- Hemorrhage in relation to shock, 50, 367 473
- Hemostasis, Method of, during nephrectomy for large  
kidney calculi, 346, use of tissue extracts for 476,  
hemostatic properties of bone-blood mass "sponges,"  
559
- Hemothorax, Treatment of acute traumatic, 306
- Hand, Ulnar fixation of first metacarpal, 246 dis-  
abilities of, 470, results of tendon suture in, 353
- Harelip, Time of operation for 270 skelton of 309
- Head, After effects of injury of, 23, importance of in-  
vestigation of equilibrium apparatus for judgment of old  
injuries of 307
- Heart, Wounds of, all clinical syndromes of short neck and  
very rare malformation of in newborn infant, 6 total  
thyroidectomy as treatment of congenital failure of  
97 X ray kymography of, 368, 466 continuities of  
4 8 disease of, complicating pregnancy 343
- Heat, Temperature and vascular reaction in treatment of  
inflammatory diseases of female genitalia with, 22
- thermo-electrical researches in obstetrics and gynecology 338, hyperthermia caused by short waves, 371
- Hepatic duct, See Bile duct
- Hepatocystodochostomy Duodenal fistula as late sequel  
of, and cholecystectomy for stones, 33
- Heredity in cancer and its abuse as in early diagnosis,  
369
- Hernia, Of stomach and spleen after traumatic laceration  
of diaphragm, 231 intercostal, of large intestine of  
spontaneous origin, 291 late results of radical operation  
for inguinal in male, 30 errors in surgical diagnosis  
4 1 multiple ventral, 24 concomitant atrophied  
umbilical, 9, occult epigastric, 10, late intestinal  
stenoses secondary to incarceration in, pre-  
cancerous, 2, comparison of operations for,  
323 diaphragmatic, 3 congenital, through right  
dome of diaphragm, 337 diaphragmatic, at atrophied  
bastes with short oesophagus and thoracic stenosis,  
5, incidence of bastes, in pregnant women and  
its significance, 313, unusual form of retroperitoneal  
or Rivet's, 334
- Herpes vesicularis, Diagnostic factors concerning, 303
- Histio-lysis, Incidence of, in pregnant women and its  
significance, 373
- Hiv, Subsequent changes in congenitally dislocated,  
induced by Piro-Lorain method, 53 classification and  
correlation of cone plane and related conditions at,  
38, fracture of femur with luxation of quadrilateral, 266,  
results of operations on patella, 356, selection of cases  
of congenital luxation of, for open reduction, 454,  
ulnar peg shift on congenital dislocation of, 453
- Hodgkin's disease, Correlation of histological changes and  
clinical symptoms in irradiated, and lymphoblastoma  
lymph nodes, 245 relation of typical, to infection and  
neoplasia, 51 five year survival in, 52, irradiation  
in, 5 1 treated by Heubner's method of continuous  
irradiation of entire body 458
- Hormone, Undescended testes treated with anterior pitu-  
itary like principle from urine of pregnancy 45, 46,  
tumors of breast related to estrin, 104, Content of  
thyroid gland, in blood during pregnancy 24, per-  
ipophyseal hormone in malignant tumors of  
ovary, 365, influence of prolactin, on formation of  
bony callus, 373
- Hormones, Action of gonadotropic substances on ovary  
18, hypophyseal and ovaries, in menstrual blood,  
30 nature of ovary stimulating, 30 relationship  
between thyroid gland and genital organs of neonatal  
female rabbits treated with pregnancy 30, influence  
of sex, on postnatal development of genital organs in  
albino rat, 375, recent progress in study of sex, 330,  
resistance of ovary to gonadotropic, 470, in relation  
to reproduction, 339 influence of, of pregnancy on  
growth of bacteria, 341
- Humerus, Fractures of upper extremity and shaft of, in  
childhood, 143 predisposition to osteochondritis dis-  
seminata of caput humeri of, 449, non union in fracture  
of shaft of, 355
- Hydatid echinococcus, Intermediate and transitional  
pathological forms between, and an solar echinococcus  
in man, 367
- Hydrocephalus, Treated by uretero-archaoid and uretero-  
dural anastomosis, 303
- Hydromyelia, Roentgenological localizations of cephalyal  
canal in, 5 5
- Hydroxyphenol, Pathological and experimental production  
of dynamic, 346 surgical treatment of, 345 dynamic,  
and sympathectomy of ureter 345
- Hyperparathyroidism, Operative treatment of, 324
- Hyperthermia caused by short wa es, 37

Hyperthyroidism, In negro, 20, remissions in, induced by pregnancy urine extract, 407

Hypoglycæmia, Action on certain fermentative processes in tumor tissue of substances causing, 164

Hypophysis cerebri, Roentgenological appearance of sella turcica in cases of adenomata of, 23, production of testicular descent with principle of anterior lobe of obtained from pregnancy urine 45 46 extragenital chorionepithelioma in male with positive anterior pituitary lobe reaction, 0-2 intermediary lobe of 9<sup>th</sup> hormones of, in menstrual blood 1-3, relation of to carbohydrate metabolism, 160 effect of castration on anterior lobe of, of female rate 107, surgical treatment of tumors of and surrounding, 0-2 308 nature of ovary stimulating hormones 2-9 roentgen study of tumors of and surrounding, 307 deformation of sella turcica by tumors in pituitary 10-23 303 hypophyseal hormonuria in malignant tumors of uterus, 330 recent progress in study of sex hormones 339, interrelationship of adrenal cortex and anterior lobe of, 373, action of extract of thymus and on contractions of uterus, 427 roentgen treatment of tumors of, 312, hormones in relation to reproduction 339, melanocyte reaction of preparations of and urine of cancer patient, 560

Hypothalamus, Relation of to carbohydrate metabolism 166

**I**CTERUS, See Jaundice

Ileitis, Roentgen diagnosis of regional 4-2

Ileocecal sphincter, Transplantation of, in anastomosis between small intestine and colon 422

Ileum, Adhesion of terminal, and ileus of adherent terminal 112 ulcerations of, following roentgen therapy 154

Ileus, Adhesion of terminal ileum and of adherent terminal ileum, 112

Incision Advantages of large muscle splitting in surgery of flank, 31

Infection, Treatment of infected wounds, 149, treatment of pyogenic, and its sequelæ, 149 relation of typical Hodgkin's disease to 251, treatment of pyogenic surgical, with artificial gastric juice 257 significance of bacteria in surgical 257 changes in cell picture in bone marrow in diseases due to 161, pyeloperistalsis characteristically altered by 162, relationship of to postoperative pulmonary complications, 460, latent pathological in tissues removed from more common operative fields, 570

Inflammations, Treatment of phlegmonous, with cod liver-oil ointment, 461

Inguinal hernia, Late results of radical operation for, 30, comparison of operations for 322

Insulin Action on certain fermentative processes in tumor tissue of substances causing hypoglycæmia 164

Internal saphenous vein Preliminary high ligation of, with injection of sclerosing solutions in treatment of varicosities, 248

Intervertebral joints, Diseases of, 450

Intestine, Intercoastal hernia of large of spontaneous origin 29, malignant tumors of large intestine 33, ulcerations of stomach and small following roentgen therapy, 154, absorption of dextrose and water by small, 159, tumors of small, 326, diverticula of small, 326 transplantation of, of ileocecal sphincter in anastomosis between small, and colon, 422, action of anaerobic and aerobic bacteria on surviving small, of rabbit, 476 contusions and ruptures of small in closed injuries of abdomen, 527

Intestines Cause of death in high obstruction of 32, observations on chlorine urea and water in high

obstruction of, 32, late stenoses of, secondary to hernial incarcerations, 111, effect of adrenal cortical extract in controlling shock following injection of aqueous extracts of closed loops of 160, suprarenals in acute occlusion of, 217, so-called interochromaffin gland of 217 anomalies of rotation of, as cause of obstruction of 325, functional derangement of, following abdominal operations 325, danger of sudden dilation of acutely distended in late low obstruction of, 3-6 calcification in tuberculosis of, 3-6, Stierlin's jump and hyperplastic tuberculosis of 330 painful abdominal conditions in childhood 535

Intratracheal anesthesia, Technique of 259

Intravenous drip, Therapeutics of, 560

Intravenous injections, Massive 500

Intussusception, In infancy and childhood 111, invagination and spasmophilia 472 intestinal at caecal tumors, 527

Iodine Schüller's test with, for early squamous-cell carcinoma of cervix, 2-6, correct and incorrect use of, in treatment of goiter, 364

Iodized salt, Thyroid surgery as affected by generalized use of, in endemic goiter region, 197

**J**ACCILLA Determination of liver function in toxæmia of pregnancy by hæmolytic reaction of, 430

Jaundice 222

Jaw Radiotherapy of cancer of, 19, pathogenesis of localized hypertrophic osteitis of maxilla, 80 treatment of fractures of neck of mandible, especially in child, 194 fracture dislocations of head of mandible, 194 treatment of malignant disease in upper, 401, precancerous epitheliomatosis of palate and, 405

Jejunal alimentation Jejunostomy with, 528

Jejunostomy with jejunal alimentation 528

Jejunum Spasm in etiology of peptic ulcers 327, collective inquiry by Fellows of Association of Surgeons regarding ulceration of, 524, clinical and roentgenological study of postoperative peptic ulcer of, 525

Joints Principles, application and results of short wave diathermy in, 379, behavior of certain reflexes of periosteal and articular origin in surgical anesthesia, 562 See also names of joints joint conditions, and operations

**K**ERATITIS, Use of thyroxin in, 298

Keratoplasty, 91

Kidney, Cancer of, 44, relation of physiology of upper urinary tract to elimination urography, 44 pathologico-anatomical changes in the organs following hæmolytic shock, 55, pyelographic injection of perirenal lymphatics, 130, effects on upper urinary tract in dogs of incompetent ureterovesical valve, 131, chromocystoscopy with phenolsulphonphthalein in diagnosis of function of 131, pyeloperistalsis characteristically altered by infection, 162, traumatic lesions of, and their treatment, 235, neoplasms of, 236 237, hæmostasis during nephrectomy for large calculi of, 346, polycystic disease of, 346, etiology of stone, 340, cutaneous ureterostomy for persistent cystitis after nephrectomy for tuberculosis of, 347, internal topography of arterial system of and pelvis of, of human beings and domestic animals, 442, treatment of bilateral calculi of, 441, pre-operative irradiation of massive tumors of, 441, nephrectomy versus auto-nephrectomy in tuberculosis of, 545, experiences and end results in injuries of urinary passages, 547

Kirschner operation for hernia, 322

Knee, Arthrotomy of, 52 treatment of suppurative arthritis of, 357, diagnosis of meniscus injuries by arthro-

- rupture 45 origin of rupture of interarticular ligaments of, 555
- Hydrocortisone-graphy of heart, 568, 566
- Symphysis and spinal cord, 62
- L**
- LABIUM MAJUS.** Congenital ectopia of ovary and tube 430
- LABOR.** Physiology and pathology of pelvic joints in relation to childbearing, 40, pathological anatomy and pathogenesis of ordema of cervix in stenosing, 41 obstetrical anasthesia induced with evipan sodium, 43 sensibility of female external genital organs and pain in conduct of, in placenta previa, with special reference to scalp forceps, 47 efficiency and economy of certain procedures intended to direct course of, 7 prognosis and management in breech presentation, 3 spontaneous transformation of face presentation into occiput presentation during period of expulsion, 33 relation between purely and pathological obstetrics, 34, thermo-electrical researches in obstetrics and gynecology 338, roentgenological study of mechanism of engagement of fetal head, 343 treatment of surgical injuries following childbirth, 345 action of thyrophenol on contractions of, 417 erythema in, 437, results obtained with thyrophenol in cases of oak labor pains, 438 delayed rupture of bag of waters, 438, method of dealing with aftercoming head, 439, obstetrical prognosis of large uterine fibroids, 34
- LABYRINTH.** Importance of investigation of equilibrium apparatus for judgment of old head injuries, 307
- LACTATION.** Acute purulent mastitis during, 56 increasing secretion of milk with antihypidic protective substances, 31
- LACTIC ACID.** Metabolism of blood in suppurative mastitis, 35
- LARYNGEAL.** Anatomy physiology and development of speech after 5
- LARYNX.** Tuberculosis of 21 96, 93, treatment of supraglottic tumors, 95, treatment of tuberculosis of, 96, stripping of vocal cords, 97 roentgenological study of tuberculosis of, 98, roentgen therapy of epitheliomas of, 99 malignant disease, premalignant conditions, and conditions simulating malignancy of 200 results of treatment of malignant tumors of 22 period from 1914 to 1937 303 lipoma of, of intracervical origin, 304, cancer of, 304, 5 treatment of abscess of, 407, treatment of cancer of, by divided doses of external radiation, 408, 304
- LATERAL SINUS.** Thrombosis of, 91
- LEG.** Roentgen therapy of vasomotor disturbances of extremities, 143 thrombosis of veins of lower extremities and pulmonary embolism, 144, 36 classification, etiology and differential diagnosis of lymphadenitis of extremities, 60, congenital periarthritis of, treated by osseous bone graft, 432
- LEGS.** Dislocation of 307
- LEUCOPLAKIA.** And cancer of cervix, 7 of penis, 346
- LEUKEMIA.** Quantitative histological studies of normal and pathological bone marrow 35 myelogenous and lymphatic, and leukemias associated with pregnancy 3 states of maturation of bone marrow 6 irradiation in, 32 treatment of, by Hildebrand's method of continuous irradiation of entire body 464
- LEGUMENT.** Anatomofunctional study of round, of testis 443
- LIP.** Radiotherapy of cancer of, of round cell, spindle-cell and sarcomatous carcinoma of, 302
- LIVER.** Pathologico-anatomical changes in the organ following hemolytic shock, 53 functional specificity of

certain regions of, 57 action of ultraviolet rays in healing of wounds of, 58, Takata's reaction in disease of, 575, solitary pedunculated adenoma of, 424 determination of function of, in treatment of pregnancy by hysterectomies reaction of Jaccoud, 430 treatment of carcinoma of, by Takata operation, 532 anatomical changes in, in liver cysts of right side of abdomen, 333

**LOBECTOMY.** Development of its main, 27 single stage: 218 open pleura, 28; one stage, for bronchiectasis, 208 for carcinoma of lung, 37

**LOOSE BONE.** Necrosis of, 449, consolidation of, 552

**LONG.** Non-operative versus operative measures in treatment of tuberculosis of 26, cystic disease of, 27 development of lobectomy and pneumonectomy in man, 375 reaction of these of, in rabbits to organic foreign bodies in bronchi, 26, mycosis of, 307 one stage of, 27 single stage lobectomy 218 open pleura, 208 surgical treatment of carcinoma of, 208, severe cerebral symptoms after operations on, 28, thoracoplasty versus pneumonectomy for tuberculosis of 207 clinical recognition and treatment of non-parasitic cystic disease of 207 one stage lobectomy for bronchiectasis, 208, thoracoplasty in bilateral or crossed tuberculosis of, 208, changes in, following treatment of cancer of breast by prolonged fractional method, 206 time of operation for abscess of, 270, influence of degree of distention upon blood flow through, 312 abscess of, 314, increasing importance of surgery in tuberculosis of, 314, serial bronchography in early diagnosis of bronchial carcinoma, 313 malignant disease of, 35 primary carcinoma of, 35 bronchial carcinoma, 36, classification of bronchiogenic carcinoma in relation to treatment and prognosis, 318, topographic classification of primary cancer of, in relation to operative indication and treatment, 318 bronchial carcinoma, 36 lobectomy for carcinoma of, 317 total removal of right, for carcinoma, 318, results of extrapleural thoracoplasty in treatment of tuberculosis of, 318, methods of dissemination of metastases in supracardiac, cervical and axillary lymph nodes, respectively, in cancer of, and their relation to lymph vessels of, 319, prevention of complications in, in surgery of stomach by pre-operative vaccination, 450, problems of pulmonary embolism, 460, relationship of infection to postoperative complications in, 460, bronchiogenic cancer combined with tuberculosis of, 318, primary sarcoma of, 39, embolism of, 581

**LUPUS VULGARIS.** Combination of roentgen therapy and moist heat therapy in, 50

**LYMPH GLANDS.** Experimental studies of healing of, and antitoxic prophylaxis of, 146, diacetylmorphine with irradiation in treatment of cancer of cervix, 277 methods of dissemination of metastases in supracardiac, cervical and axillary in pulmonary cancer and their relation to lymph nodes of lungs, 419

**LYMPH VESSELS.** Physiographic injection of peritumors, 304 roentgenological method of examination of, in man and animals, 34 methods of dissemination of metastases in supracardiac, cervical, and axillary lymph nodes, in pulmonary cancer and their relation to, of lungs, 419

**LYMPHOBLESTOMA.** Correlation of histological changes and clinical symptoms in irradiated Hodgkin's disease and lymph nodes of, 146, etiology of, 146

**LYMPHOMAS.** Classification, etiology and differential diagnosis of, on basis of 300 cases, 160

**LYMPHOGRADELOMA TYPICUM.** 548, inflammatory structure of rectum and their relation to, 5

Lymphogranulomatosis, Quantitative histological studies of normal and pathological bone marrow, 55  
Lymphogranulomatosis maligna, *See* Hodgkin's disease  
Lymphosarcoma, Irradiation in, 252

**MALIGNANCY**, *See* Cancer, Sarcoma, names of organs  
Mandible, *See* Jaw

Mastitis, Acute purulent, during lactation, 26, pathogenesis of cystic, 416

Maxilla, *See* Jaw

Maxillary sinus, Chronic pyogenic inflammation of, and other accessory sinuses, 509

Mediastinum, Surgical treatment of perincural fibroblastoma of, 29, sarcomata of glands of, 321

Megacolon, Anal achalasia and, 221

Meibomian gland, Adenocarcinoma of, 301

Meninges, Angiomatosis of, associated with calcifications of brain cortex, 101, primary melanotic tumors of central nervous system and its membranes, 307

Meningiomata, Parasagittal, 100, attached to mesial part of sphenoid ridge with syndrome of unilateral optic atrophy, defect in visual field of same eye, and changes in sella turcica and shape of interpeduncular cistern after encephalography, 309

Meningitis, Forced drainage for treatment of, secondary to ear and sinus infections, 18, pathways of infection in suppurative, 100

Meningo-encephalitis caused by cysticercus cellulosæ, 514  
Menorrhagia, Indications for use of progestin in treatment of, 433

Menstruation, Hypophyseal and ovarian hormones in menstrual blood, 120, endometrial findings in functional disorders of, 120, choline in menstrual cycle, 538, and menstrual disorders, 539

Mesentery, Primary tumors of, 323

Metabolism, Relation of hypophysis, hypothalamus, and autonomic nervous system to carbohydrate, 166, application of thyroxin as an alterant of 298

Metacarpal, Unusual luxation of first, 246

Metals, Influence of certain, on fixation of mineral components in cultures of osteoblasts, 554

Microcytes, Presence of, in round-celled sarcomata as histological evidence of sensitivity of these tumors to irradiation, 59

Milk, Increasing secretion of, with antithyroid protective substances, 233

Mouth, Radiotherapy of cancer of, 19, comparison of apparent end results in cases of carcinoma of, in relation to length of follow up, 94, malignant neoplasms of upper respiratory tract in young, 302, comparison of protracted external irradiation with X rays, 5 gm. radium pack, and 100 mgm radium pack in treatment of neoplasms of, 467

Mucin therapy for gastroduodenal ulceration, 11

Mucocoele, Experimental production of, 222

Mucus, Secretion of, by epithelial cells of gall bladder and experimental production of mucocoele, 222

Muscle, Treatment of permanent paralysis of deltoid, 453  
Muscles, So-called "primary" tuberculosis of, 50, shock due to trauma to, 159, ultraviolet rays in healing of wounds of, 256, research on myopathies, 550

Myoma, Spontaneous rupture of capsule of, 427

Myopathies, Research on, 550

Myositis ossificans, Progressive, 350

Myxoedema in children, 196, 510

Myxomata, Histological and critical study of, 269

Myxomatoid tumors, Histological and critical study of, 269

**NAVICULAR** bone Malacias of of wrist, 50, treatment of fractures of carpal scaphoid, 142

Neck, Radiotherapy of cancer metastases in glands of, 19, clinical syndrome of short, and very rare malformation of heart in newborn infant, 61, anatomical and clinical study of parapharyngeal space, 94, roentgenological study of tuberculosis of, 198, malignant epithelial tumors of, 466

Necrosis, Following irradiation, 59, 155, 157, 265, prevention of, in plastic repair of breast, 206

Negro, Hyperthyroidism in, 20

Nephrectomy, Cutaneous ureterostomy in persistent cystitis after, for tuberculosis, 347, versus auto-nephrectomy in renal tuberculosis, 545

Nephritis, Painful and hæmaturic, 236, value of decapsulation in cases of medical and surgical, 443

Nephrolithiasis, Etiology of, 346

Nephrotomy, Method of hæmostasis during, for large kidney calculi, 346

Nephro ureterectomy, New method for complete, for primary tumor of ureter, 347

Nerve, Malignant tumor of left tibial, 25, operative treatment for palsy of facial, 310, 414, surgical anatomy of presacral, 311, pathological conditions of abducens, 402, paralysis of trochlear, 403, paralysis of oculomotor, 403, tumors arising from sensory root of trigeminal, in posterior fossa, 414, paralysis of facial, treated by cervical ganglionectomy, 414, resection of presacral, for relief of pain, 471, spasm of oculomotor, in Gradenigo's syndrome, 508

Nerves, Variations of alimentary glycæmia induced by alcoholic injection of splanchnic, 203, effects of unilateral and bilateral resection of major and minor splanchnic, on essential hypertension, 204, normal shadow of peripheral, and their pathological change in injury and tumor, 415, of distal colon, 423, surgeon and pain, 471, isolated tumors of peripheral, 516

Nervous system, Relation of autonomic, to carbohydrate metabolism, 166, primary melanotic tumors of central, and its membranes, 307, relation between sympathetic, blood calcium, and parathyroids, 572

Neuralgia, Bilateral trigeminal, 202, glossopharyngeal, 414

Neurinoma of orbit, 18

Neurofibromatosis with cutaneous and bony changes 516

Neutrophile cells, Origin of toxic granulations in, in circulation, 161

Newborn, Clinical syndrome of short neck and very rare malformation of heart in, 61, vaccination of 268, prenatal medication as possible etiological factor of deafness in, 301, thermo-electrical researches in obstetrics and gynecology, 338, influence of thymectomy on genetic activity and offspring, 340

Nipple, Paget's disease of, 416

Nose, Results of treatment of malignant tumors of, 302 so-called mucoid cysts of, 404, therapeutic use of streptococcus serum in infections of, 406

Novocain, Peritartular injections of, in management of sprains and traumatic arthritis, 550

Nucleus pulposus, Herniation of, as cause of compression of spinal cord, 203

**OBSTETRICS**, Endothelial sign in, 122, reaction of blood to guttadiaphot in, 128, evaluation of clinical statistics on relation between parity and pathological, 234, thermo-electrical researches in, 338, ergotamin in, 437

Occiput presentation, Spontaneous transformation of face presentation into, during period of expulsion, 232

Oculomotor nerve, Paralysis of, 403, spasm of, in Gradenigo's syndrome, 508

Œsophagoplasty, Anterotheracic, for impermeable stricture of Œsophagus, 318

- (Esophagus, Anatomy of abdominal portion of, 9; anterothoracic esophagoplasty for impermeable stricture of, 3; cancer of, 3; surgical exposure of, 330; swallowed foreign bodies, 330; indications and late results of treatment of cricoid stenosis of, 32; primary tuberculous of, 3; diaphragmatic hernia; 1 hiatus of, 114; short, and thoracic stomach, 323
- (Larva, Tumors of breast related to, 84
- Offspring, Influence of thyroectomy on, 340
- Oil, Treatment of wounds by local application of whale, 33; cod liver oil treatment of fresh wounds, burns, and phlegmonous inflammations, 46
- (Old tuberculosis, Treatment of leishmaniasis with, 3
- Other, dyschondroplasia, 330
- Operation, Water balance in surgical conditions, 37; changes in blood sugar level associated with, 6; pulmonary embolism following, 143; acute dilatation of stomach complicated by perforation after, 143; Brauer's, for cardiac myopathy, 309; states of excitement after, 33; indications for early, 370; functional detachment of intestine following abdominal, 353; wound complications after, 344; evacuation after, 344; appendical fistula after, 413; prevention of pulmonary complications after on stomach, 439; relationship of infection to pulmonary complications after, 460; pathogenesis of paratyphoid after, 46; clinical and roentgenological study of peptic ulcer after, 315; treatment of carbuncles of lip by Talma, 338; bad risks for, 370; latent pathological microbe in tumors removed from more common operative fields, 370
- Ophthalmology, Ueber theory of sympathetic, 303
- Ophthalmology, Ad antigens of intravenous organ arsenic in, 93; use of thyrotoxin in, as local agent and as metabolic alternative, 303; cholelithiasis and, 303
- Optic canal, Unilateral central and anular scotomas produced by fracture extending into, 93
- Orbit, Neurotoma of, 3; keratango-endotheloma of removed through transnasal approach, 9
- Orethra, Acute tuberculous epididymitis and epididymo-orchitis, 34
- Osmicaceous, Post traumatic, 36
- Osteitis tuberculous multiplex cystica, 340
- Osteoblasts, Influence of certain metals on fixation of mineral components in cultures of, 354
- Osteochondritis deformans juvenilis, Classification and correlation of and related conditions to hip, 38
- Osteomalacia, Subcapsular cataract in, 307
- Osteomyelitis, Sclerosing, 48; acute, 48; new attempt at treatment of chronic, 40; in first years of life, 42; See also names of bones
- Osteopetrosis, 340
- Osteosclerosis, Frigida generalisata, 340; congenital, 340
- Osteomyelitis, Value of modern methods of by external fixation in adults, 357
- Otitis media, Otolomotor nervi spasm in Gradenigo syndrome, 303
- Otocerous, Problem of, 45
- Ovary, Results of postoperative X-ray therapy in carcinoma of, 38; blood transfusion in certain gynecological conditions, 38; action of gonadotropic substances on, 48; also of postoperative roentgen irradiation in carcinoma of, 9; hormones of in menstrual blood, 30; sensibility of female internal genital organs, temperature and vascular reactions in treatment of inflammatory diseases of female genitalia with heat, 23; lymphosarcomatosis of female genital organs, 3; effect of castration on anterior hypophysis of female rat, 67; nature of hormones stimulating, 330; endometriosis as manifestation of dysfunction of, 39; appendicitis in gynecology, 30; metastasis
- therapy is gynecological inflammations, 363; granulosa-cell tumors of, 337; postnatal development of genital organs in albino rat, 338; thermoelectrical researches in obstetrics and gynecology, 338; recent progress in study of sex hormones, 339; rris and segmentary arrangement of, 430; congenital ectopia of, and tubal ne larynx may, 430; resistance of, to gonadotropic hormones, 430; constitutional predisposition to tumors of genital organs in female, 433
- Leishmaniasis, Tuberculosis of, 303
- Ovary, Time of bones,
- PAGETS disease of nipple, 4, 6
- Pain, Relief of intractable by intraspinal injection of alcohol, 341; problems of sensibility of female internal genital organs and, in gynecological diseases and labor aspects of, 366; symptoms and, 47
- Palata, Radiotherapy of cancer of, 9; pre cancerous epitheliomas of, 405 "push back operation" in surgery of cleft, 405
- Pancreas, Fistula of cured by pancreatogastrostomy, 244; cysts in typhoid of, 436
- Pancraticitis, Conservative treatment of acute, 6; acute, 6; adenoma, 34
- Pancraticogastrostomy, Pancreatic fistula cured by, 24
- Papilloedema, Ophthalmic symptoms in brain disease, 41
- Paralysis, Treatment of spastic, 4; operative treatment of facial, 1; 4, 413; of adductor 35; muscles, 400; peripheral facial, treated by cervical ganglionectomy, 414; treatment of periorbital, of deloid muscle, 433
- Paronychia, Retraction of fornx and left, in hypoplasia of genitalia, 434
- Parapharyngeal space, Anatomical and clinical study of, 94
- Parasitaphys, 30
- Parathyroid glands, Transplantation of in the grafts of, 68; treatment of hyperparathyroidism, 374; surgery of, 478; relation between sympathetic nervous system, blood calcium, and, 373
- Parity, Relation between, and pathological obstetrics, 334
- Parotid gland, Benign and malignant tumors of, and their sensibility to cure, 6
- Parsitis, Pathogenesis of postoperative, 481
- Pateila, Treatment of irreducible congenital dislocation of, 337
- Pateila paritila, 333
- Pavlov treatment, Is peripheral obliterative arterial disease, 36; in arteriosclerotic peripheral vascular disease, 44
- Pelvis, Physiology and pathology of joints of, in relation to child bearing, 400; architecture of, 97; new measurement for estimating depth of, 30
- Perna, Malignant neo-cardiovascular tumor primary in corpora uterina of, with normal and essential metastases, 33; treatment of malignant disease of, 39; leucoplakia of, 345
- Pericarditis, Tuberculosis, 309; pathological anatomy of, 320
- Pericardium, Brauer operation for cardiac myopathy, 309
- Perforation, Treatment of surgical injuries following childbirth, 345
- Peristalsis, Mechanism of reflexes originating in, in surgical anesthesia, 36
- Peripheral nerves, Normal shadow of and their pathological changes in injury and tumor, 433; isolated tumors of, 3, 6
- Peritoneal cavity, Perforation of carcinoma of stomach into general, 43
- Peritonitis, Peridysmiosis of of appendical appendix, 33
- Peritonitis, Bile, 3; treatment of suppuration, by alcohol light, 40; so-called primary cryptogenic or



- metastatic streptococcic, 213, time of operation for, 270, clinical and microbiological studies of, and its prevention and treatment with serum, 322, painful abdominal conditions in childhood, 533, cryptogenic, caused by pneumococci and related bacteria, 534
- Pes cavus, Treatment of, 543
- Pharynx, Anatomical and clinical study of parapharyngeal space, 94, treatment of lingual tonsil and lateral bands of lymphoid tissue in, 196, roentgen therapy of epitheliomata of, 199, results of treatment of malignant tumors of, 302, malignant neoplasms of upper respiratory tract in young, 302, anatomical study of peritonsillar spaces, 303, use of streptococcus serum in infection of, 406, treatment of cancer of, with divided doses of external radiation, 408, comparison of protracted external irradiation with X-rays, 5 gm radium pack, and 100-mgm radium pack in treatment of neoplasms of, 467, fractional or divided dose method of external irradiation in treatment of cancer of, 564
- Phenolsulphophthalein, Chromocystoscopy with, in diagnosis of kidney function, 131
- Phlebitis, Spontaneous, occurring during course of development of uterine myomata, 223, obstetrical, of subacute venous septicæmia type, 233, thermo-electrical researches in obstetrics and gynecology, 338, blood changes in clinical thrombophlebitis and their diagnostic importance, 558
- Phosphorus, Influence of local excess of calcium and, on healing of fractures, 53
- Phrenicectomy in pulmonary tuberculosis, 314
- Pilonidal cysts, 372
- Pilonidal fistulæ, 372
- Pituitary gland, *See* Hypophysis cerebri
- Placenta, Relation between parity and pathological obstetrics, 234, behavior of blood sugar after injections of extracts of, 440
- Placenta prævia, Conduct of labor in cases of, with special reference to scalp forceps, 127, relation between parity and pathological obstetrics, 234
- Plasmocytoma and rhabdomyoma of paranasal sinuses, 19
- Pleura, Severe cerebral symptoms after operations on, 108, single-stage lobectomy with open, 108, changes in lungs and, following roentgen treatment of cancer of breast by prolonged fractional method, 264
- Pneumectomy, Development of, in man, 27
- Pneumococci, Cryptogenic peritonitis caused by, and related bacteria, 534
- Pneumolysis in treatment of pulmonary tuberculosis, 314
- Pneumothorax, Thoracoplasty versus, 207, in surgical treatment of pulmonary tuberculosis, 314, artificial, in abscess of lung, 314
- Polyarthritis nodosa, Gangrene of fingers and toes in, 144
- Pregnancy, Blood transfusion in, 38, active expansion of uterus according to Sfaenzi and its value in physiologic of, 40, physiology and pathology of pelvic joints in relation to childbearing, 40, production of testicular descent with anterior pituitary like fraction of urine of, 45, 46, endothelial sign in obstetrics and gynecology, 122, work of urinary bladder in, 124, content of thyroid gland hormone in blood during, 124, of abnormal conditions of, and sugar content of blood of mother and child, 125, myelogenous and lymphatic leukæmias and aleukæmias associated with, 125, neuroleukæmias and aleukæmias associated with, 125, pernicious vomiting vegetative state in pyelitis of, 126, guttadiaphot in obstetrics, of, 126, reaction of blood to guttadiaphot in obstetrics, 129, relationship between thymus gland and genital organs of immature female rabbits treated with hormones of, 230, relation between parity and pathological obstetrics, 234, thermo-electrical researches in obstetrics and gynecology, 338, gonorrhœa and, 341, analysis of errors inherent in tests for, based on Aschheim Zondek reaction, 341, influence of, on tumor growth, 342, remissions in hyperthyroidism induced, by extract of urine of, 407, differential diagnosis of, 435, ectopic, 435, autogenous vaccines in treatment of pyelonephritis of, 436, determination of liver function in toxæmias of, by hæmolytic reaction of Jacchia, 436, incidence of hiatus hernia in, and its significance, 523, influence of hormones of, on growth of bacteria, 541, heart disease complicating, 542, obstetrical prognosis of large uterine fibromata, 542
- Presacral nerve, Surgical anatomy of, 311, resection of, for relief of pain, 471
- Proctitis, Pathogenesis and treatment of proliferating and stenosing, 220, simple hæmorrhagic, 330
- Proctosigmoiditis, Simple hæmorrhagic, 330
- Progesterin, Indications, for clinical use of, 433
- Proteolysis, Migrating intravascular, 359
- Prolan, Value of in treatment of abnormal uterine bleeding, 37
- Pronation, Pathogenesis of painful, in young children, 552
- Prostate, Autopsy findings in cancer of, 45, calculi of, 45, 446, carcinoma of, 45, treatment of hypertrophy of, by new "shrinkage" method, 239, comparative effects of various high frequency current and of thermal cauterization in resection of, 239, surgery of obstruction of, 348, influence of hormone of, on formation of bony callus, 573
- Prostatectomy, Harns technique for, 44, surgery or prostatic obstruction, 348
- Prostitutes, Specificity and behavior of gonoreaction in, 230
- Pseudomyxoma peritonei of appendiceal origin, 35
- Psychic trauma, Abortion due to, 543
- Psychoses, Postoperative, 255
- Puerperium, Severe anemia in, 128; obstetrical phlebitis of subacute venous septicæmia type, 233, relation between parity and pathological obstetrics, 234, thermo-electrical researches in obstetrics and gynecology, 338, practical measures in prevention and treatment of sepsis in, 343, clinical study and treatment of late hæmorrhage in, 343, modern management of fever in, 344, treatment of surgical injuries following childbirth, 345, choline in menstrual cycle and, 538
- Pulmonary embolism, 460, 561, as complication of trauma, 144, following surgical operation, 148
- Purpura hæmorrhagica, Treatment of Werilhof's disease with seroplasma, 249
- "Push back operation" in cleft palate surgery, 405
- Pyelitis, Neurovegetative state in, of pregnancy, 126
- Pyelography, *See* Urography
- Pyelonephritis, Autogenous vaccines in treatment of, of pregnancy, 436
- Pyelostenosis as characteristically altered by infection, 162
- Pylorus, Operative treatment of hypertrophic stenosis of, in infants, 324
- Pyogenic infection, Treatment of, and its sequelæ, 149
- Pyonephrosis, Gonococcal, 131
- RACHISYNTHESIS**, Indications for, 356
- Rachitis, Adult and fetal, 549
- Radionecrosis, Clinical study of, 155, pathological manifestations in, 157
- Radiosensitivity, Problem of, 262
- Radio-ulnar synostosis, Study of congenital, 352
- Radium, In treatment of parotid tumors, 17, in treatment of cancer of mouth, 19, 94, 467, in treatment of uterine hæmorrhages of benign origin, 37 335, presence of

- microcytes in round-celled sarcomata as histological evidence of sensitivity to, 59; comparison of apparent end results in relation to length of follow-up in cases of carcinoma of mouth treated with, 64; use of in carcinomas of bladder, 3; clinical study of radionecrosis, 33; pathological manifestations in radionecrosis, 37; statistical review of 500 cases of primary rectal carcinoma treated with, 220; iliac lymphadenectomy with, treatment in cancer of cervix, 7; ureteral occlusion following implantation of into cervix, 377; in treatment of lymphosarcoma, Hodgkin disease, and leukemia, 5; problems of sensitivity to, 262, 263; classification of tumors according to sensitivity to, 263; action of, on these cultures, 264; necrosis following treatment with, 265; treatment of epitheliomas of skin, 266; in treatment of cancer of nasal accessory sinuses, 301; results of treatment with, of malignant tumors of ear, nose, pharynx, and larynx, 302; in treatment of malignant disease of lung, 5; in treatment of cancer of oesophagus, 3; 9; in treatment of carcinoma of cervix, 326; limitations and dangers of local uterine application of in carcinoma of body of uterus, 336; in treatment of bone metastases from breast carcinoma, 330; in treatment of epithelioma of cheek, 405; in treatment of cancer of pharynx, tongue, and extrinsic larynx, 406; in treatment of pericardial val at primum, 43; comparison of, with X-rays in treatment of neoplasms of mouth and throat, 467; relative value of surgery roentgen rays, and, in carcinoma of breast, 5; 7; (uterine treatment with, in carcinoma of breast, 5; 7; histological classification of cancers of uterine cervix and relation between growth structure and results of treatment with, 537)
- Rachis, Osteoparal myeloma of, and skin, 35
- Radium, Use of in treatment of pericardial val at primum, 431
- Radiation, See Synchrotherapy
- Raynaud's disease, Roentgen therapy in, 143; cases of failure of operations for, 340
- Rectum, Malignant tumors of, 33; high amputation of, 36; inflammatory structures of, and their relation to lymphogranuloma venereum, 5; pathogenesis and treatment of proliferating and stenosing proctitis, 200; statistical review of 500 cases of primary carcinoma of, under radiation treatment, 220; cancer of, 424; graded perineo abdominal resection of, 350, 351
- Reproduction, Influence of thyroectomy on, 340; hormones in relation to, 539; prolonged administration of theelin and theelin to rats and its bearing on, 530
- Respiratory tract, Malignant neoplasms of upper, in young, 304
- Retina, Metastatic carcinoma of, 18; hemangioendothelioma cysts of, 93; detachments of treated by diathermy, 95; experimental detachment of, 303; detachment of, presenting unusual features after operation by surface diathermy, 404; operative results in detachment of, 307
- Rheumatism, Tuberculous, 38; chronic proliferative arthritis in patients with rheumatic fever, 448
- Rube, Acute osteomyelitis of, caused by ordinary pus cocci, 51
- Rickets, Adult and fetal, 540
- Ruhs, Ried surgical, 579
- Roentgen rays, Distribution of in human body, 308
- Roentgen ray diagnosis, Of adenoma of hypophysis, relation of physiology of upper urinary tract to examination topography, 44; of Brodie chronic bone abscess, 42; of chondrodroplasia, 49; importance of intracranial pressure in circulatory conditions of brain in arteriographic visualization, 98; of retrocaval tumors, 99; pyelographic injection of peritoneal lymphatics, 130; diagnostic uses of thorium dioxide, 54; of changes in pyelogram due to infection, 161; of changes in petrous portion of temporal bone without clinical manifestations, 251; of tuberculous of larynx and neck, 26; encephalography in children, 28; roentgen appearance of normal anastomosis of colon, 28; roentgen method of examination of lymphatic system in man and animals, 5; tumors of hypophysis and hypophyseal region, 307; changes in sella turcica and shape of intrapetrous cistern shown by encephalography in cases of meningiomas attached to basal part of sphenoid ridge, 309; of long aorta, 314; of bronchial carcinoma, 3; 5; 6; of anastomosis of colon, 317; roentgen appearance of masses of colon in pathological conditions, 324; Stricker pump and hyperplastic lateral tubercles, 330; sources of error in oral cholecystography and suggested methods of correction, 333; roentgenological study of mechanism of engagement of fetal head, 343; results of arteriography in choroma of arteries and tumors, 360; of cardiac disease, 362, 454; significance of abnormally shaped subarachnoid cisterns as seen in encephalogram, 414; normal shadow of peripheral nerve in and their pathological change in injury and tumor, 4; 5; of regional lesions, 44; roentgen anatomical studies of internal topography of arterial system of kidney and renal pelvis of human beings and domestic animals, 443; of nervous system, 452; information obtained by arteriography in certain vascular diseases of extremities, 457; roentgenological visualization of epiphyseal canal in hydrocephalus, 5; 5; of postoperative peptic ulcer, 545; of tumors of bladder, 546; of chronic neuritis, 551; critical study of arteriography, 552; changes of arteriography, 552
- Roentgen ray treatment, Of parotid tumors, 6; of cancer of mouth, 9; 54; 467; of uterine malignancy, post-operative, in carcinoma of ovary, 32, 3; of tumors of testicle, 46; presence of microcytes in round-celled sarcomata as histological evidence of sensitivity to irradiation, 50; necrosis due to, 50, 55, 57; of seminoma, 50; combination of and most heat therapy in lupus vulgaris, 50; comparison of apparent end-results of, in cases of carcinoma of mouth in relation to length of follow-up, 54; of anastomotic disturbances of extremities, 243; correlation of histological changes and clinical symptoms in irradiated Hodgkin's disease and lymphoblastoma lymph nodes, 246; of cancer of skin, 54, 56, 58; ulceration of stomach and small intestine following, 54; action on certain fermentative processes in tumor tissue of substances causing hypoglycemia, 64; of epithelioma of pharynx and larynx, 90; primary rectal carcinoma under, 220 and iliac lymphadenectomy in cancer of cervix, 217; of lymphosarcoma, Hodgkin's disease, and leukemia, 251; problems of radionecrosis, 263; of gynecological malignancies, 263; classification of tumors according to radionecrosis, 263; changes in lungs and pleura following, of cancer of breast by prolonged fractional method, 264; of epithelioma of skin, 266; results of, of malignant tumors of ear, nose, pharynx, and larynx, 302; of carcinoma of larynx, 304; of syringomyelia, 310; of abscess of lung, 314; of cancer of oesophagus, 319; of carcinoma of cervix, 326; distribution of roentgen rays in human body, 308; reasons for failures in, of carcinomas, 349; of epithelioma of cheek, 405; of cancer of pharynx, tongue, and extrinsic larynx by divided doses of external, 406; technique and results of in carcinoma of breast, 417; pre-operative, of nervous tumors of kidney, 444; comparison of with end-

- of 5 mgm. and 100-mgm. radium pack for protracted external irradiation of neoplasms of mouth and throat, 497, Heublein's method of continuous, of entire body for generalized neoplasms, 468, of pituitary tumors, 512, relative value of surgery, radium, and, of carcinoma of breast, 517, of tumors of bladder, 546, of painful conditions of brachioscapular region 550, of carbuncles, 561, of cancer with extremely hard rays, 564, fractional method of, in cancer of pharynx tonsil, larynx, and paranasal sinuses, 564, influence of fractionation of on end results of, 564, modified Coutard, 564
- Rofso's test, Statistical results of, in 11,000 cases of cancer, 270
- Round ligament, Anatomicofunctional study of of femur, 243
- SACROCOCCYGEAL** chordoma, 61 515
- Sacro-iliac surgery, 356
- Saliva, 93
- Sangos, Haemostatic properties of, 559
- Sphenous vein, Preliminary high ligation of internal, with injection of sclerosing solutions in treatment of varicosities, 248
- Sarcoma, Presence of microcytes in round celled as histological evidence of sensitivity to irradiation, 59 See also names of organs
- Scalp, Epidermoidal glioma of, 89
- Scalping, Treatment of, by transplantation, 254
- Scaphoid bone, See Navicular bone
- Scapula, Exostosis bursata of, 242
- Scarlet fever, Appendicitis and acute inflammatory abdominal conditions in, 114
- Schiller's test for early squamous-celled carcinoma of cervix, 226
- Schmieden operation for hernia, 322
- Scoliosis, And spinal cord, 102, cause and treatment of, 352
- Scotoma, Unilateral central and annular produced by callus from fracture into optic canal 92
- Sella turcica, Roentgenological appearance of in cases of adenoma of hypophysis, 23, primary melanotic tumors of central nervous system, 307, deformation of by tumors in pituitary fossa, 308, changes in, associated with meningioma attached to mesial part of sphenoid ridge, 309, suprasellar craniopharyngioma 512
- Semilunar bone, See Lunate bone
- Seminal vesicle, Postnatal development of of albino rat, 338
- Seminomata, Radiotherapy of 59
- Septicæmia, Obstetrical phlebitis of subacute venous type 233, practical measures in prevention and treatment of puerperal sepsis, 343, modern methods of management of puerperal fever, 344, pathogenesis and clinical aspects of colon bacillus, 474, surgical, of exclusively staphylococcal or streptococcal origin, 475, chronic staphylococcus septicopyæmia with prolonged course, 572
- Seroplacental, Treatment of Werlhof's disease with, 249
- Serum, Prevention and treatment of peritonitis with, 322, therapeutic use of concentrated antistreptococcus, of New York State Department of Health, 373, 406
- Serum shock following tetanus vaccination and its treatment, 258
- Serum sickness following tetanus vaccination and its treatment, 258
- Shock, Pathologico-anatomical changes in organs following hæmolytic, 55, primary, 159, and trauma to muscles, 159, hæmorrhage in relation to, 159, 267, 472, effect of adrenal cortical extract in controlling, following injection of aqueous extracts of closed intestinal loops, 160, serum, following tetanus vaccination and its treatment, 258, influence of exposure to cold and deprivation of food and water on development of, 372, etiology of traumatic, 566
- Shoulder, Exostosis bursata of scapula, 242, calcareous deposits in supraspinatus tendon and subacromial bursa, 242, painful conditions of brachioscapular region and their treatment with physical agents, 350, cause and treatment of round, 552
- Sigmoid, Malignant tumors of, 33, right sided symptoms with diverticulitis of, 34, surgical treatment of volvulus of, 114, cancer of, 424, graded perineo-abdominal resection of, for cancer, 530, 531
- Sigmoid sinus Thrombosis of, 193
- Sigmoiditis, Simple hæmorrhagic, 330
- Simmonds' disease, 107
- Sinus, Thrombosis of sigmoid or lateral, 193
- Sinuses, Forced drainage for treatment of meningitis secondary to infections of nasal, 18, plasmocytoma and rhabdomyoma of paranasal, 19, cancer of nasal accessory, 301, chronic pyogenic inflammation of antrum and other accessory, 509, fractional dose method of external irradiation in cancer of paranasal, 564
- Sinusitis, Pathology of chronic, in children, 196
- Skin, Combination of roentgen therapy and moist heat therapy in lupus vulgus, 59, radiation therapy of cancer of, 154, melanotic neoplasms of, 163, experimental alteration of malignancy by intracutaneous inoculation of preserved homologous mammalian tumor material, 165, action of ultraviolet rays in healing of wounds of, 256, treatment of epithelioma of, 268, determinations of temperature of, in obstetrics and gynecology, 338, neurofibromatosis with changes in, 516
- Skull, After effects of head injury, 23, unilateral central and annular scotoma produced by callus from fracture into optic canal, 92, fractures of, 193, importance of investigation of equilibrium apparatus for judgment of old head injuries, 307
- Smallpox, Vaccination of newborn infants against, 268
- Spasmophilia and invagination, 472
- Spastic paralysis Treatment of, 141
- Spermatic cord, Torsion of, 133
- Spiegel's hernia with strangulated umbilical hernia, 110
- Spine, Sacrococcygeal chordoma, 61, kyphoscoliosis and spinal cord, 102, subacute suppurative osteomyelitis of atlas, 352, indications for rachisynthesis, 356, diseases of intervertebral joints, 450, treatment of fractures of vertebral bodies uncomplicated by lesions of cord, 555
- Spinal anesthesia, Subarachnoid anesthesia, 367, use and abuse of, 562
- Spinal cord, Kyphoscoliosis and, 102, herniation of nucleus pulposus as cause of compression of, 203
- Splanchnic nerves, Variations of alimentary glycæmia induced by alcoholic injection of, 203, effects of unilateral and bilateral resection of major and minor, in essential hypertension, 204
- Spleen, Traumatic laceration of diaphragm with hernia of stomach and, 28, action of ultraviolet rays on healing of wounds of, 256, rupture of normal, without known cause, 532, heterotopic ossification in, 567
- Splenomegaly, Chronic congestive, and its relationship to Banti's disease, 333
- Sprains, Acute and chronic, 351, pathology and treatment of, 351, periarthritic injections of novocain in management of, 550
- Staphylococcus, Symptoms of surgical septicæmia due to, 475

- Status thymicolymphaticus, 366 clinical implications of 37
- Sterilia Jump in roentgenograms made in hyperplastic intestinal tuberculous, 330
- Stomach, Review of 933 literature on gastroduodenal ulcerative disease, 1 traumatic laceration of diaphragm with hernia of 35 clinical aspects of tuberculous of 323 cancer of, 0, acute postoperative dilatation of complicated by perforation, 148, ulcerations of following roentgen therapy 34, nature of healing of surgical wounds of, in relation to technique of suture, 4, time of operation for ulcer of 70 operative treatment of hypertrophic stenosis of pylorus in infants, 324, spasm in etiology of peptic ulcers, 337, perforation of carcinoma of into general peritoneal cavity 43 prevention of pulmonary complications in surgery of, by pre-operative sedation, 456, thoracic, in case of diaphragmatic hernia at esophageal hiatus with short esophagus, 3 complications of foreign bodies in, 514 collective inquiry by Fellow of Association of Surgeons into gastrojejunal ulceration, 324 nature and treatment of peptic ulcer based on 1,435 cases, 5, 3, summary in treatment of peptic ulcer, 360 pairs of abdominal conditions in childhood, 333
- Str. Berry gall bladder Experimental production of 3
- Streptococcus, So-called primary cryptogenic or metastatic peritonitis due to, 3 therapeutic use of concentrated antistreptococcus serum of New York State Department of Health, 373 406, putrid esophagus due to anaerobic, 418, symptoms of surgical septicemia due to, 475 septicopyemia due to with prolonged course, 37
- Stroop method, Analysis of 17 cases of ectropion treated by modified, 341
- Subacromial bursa, Calcareous deposits in, 443
- Subarachnoid anastomosis, 307
- Subarachnoid cysts, Separation of abnormally shaped, as seen in encephalogram, 414
- Sublingual gland, Intracapsular calcification of 89
- Sugar, Changes in level of in blood associated with surgical operations, 6 abnormal conditions of pregnancy and content of, in blood of mother and child, 5, action of certain fermentative processes in tumor tissue of substances causing hypoglycemia, 104 variations of alimentary glycemia induced by alcoholic rejection of splanchina, 303 behavior of blood after injection of placental extracts, 490
- Supraglottic tumors, Treatment of, 95
- Suprarenal, Suprarenal cortical syndrome, 30, aberrant adrenal tumor in epididymis, 34, effect of extract of cortex of in controlling shock following resection of aqueous extracts of closed intestinal loops, 60, in acute intestinal occlusion, 7 transplantation of cortex of, for Addison disease, 35 behavior of lactic acid of blood in insufficiency of 35 influence of on formation of bony callus, 349 interrelationship of cortex of, and anterior lobe of hypophysis 374, hyperfunction of cortex of, 443 tumors of 44 high pressure crises due to, 443
- Suprarenallectomy, For arterial hypertension, 6 effects of in male rats, 35
- Supraspinatus tendon, Calcareous deposits in, 443
- Surgical risks, Bed, 570
- Suture, Nature of healing of surgical wounds of stomach in relation to technique of 14
- Sutures, New Physiological material for 368 allergy to catgut, 473
- Sweat glands, Relationship of so called umbilical adenoma to apocrine, 21
- Sympathectomy Effect of epinephrine on human extremity subjected to, 249 for relief of pain, 47 dynamic hydrophobes and of ureter, 345
- Sympathetic nervous system, Neurovegetative state in psychosis of pregnancy 36 relation between blood calcium, parathyroids, and, 57
- Sympathetic ophthalmia, Allergy theory of, 308
- Synoviositis, Surgical treatment of, 243 treatment of, with X-rays, 3
- TAKATA-ARA reaction in surgical conditions, 17
- Talipes, See Club-foot
- Talpa operation in treatment of cystitis of liver 333
- Talocalcaneal joint, Arthrodesis of, in treatment of severe malunion of foot, 244
- Teeth, Intracardiac bacteria in dental granuloma, 94, heterotopic teeth and their significance,
- Temperature, Research regarding surface, of body in obstetrics and gynecology 338, hyperthermia caused by short 37
- Temporal bone, Koestner changes in petrous portion of temporal bone without cholea mastoidectomy, 95
- Tendon, Calcareous deposits in supraspinatus, 443
- Tendons, Healing of experimental lesions of, 337, results of nature of in hand, 333
- Tenax Arm, Cause and treatment of 35
- Terratomata, Structure of, 474, testicular ovaries, 368
- Testicle, Differential diagnosis and treatment of tumors of, 48 production of testicular descent with antenatal-pituitary like function of pregnancy serum, 45, 48, congenital cancer and tuberculous of, 47 malignant tumors of 47 torsion of spermatic cord, 331 acute tuberculous epididymo-orchitis, 343 origin of cryptorchidism, 33 malignant growth of microorchid, 33 chemical and pathological study of fibrosarcoma of tunica albuginea, 30 results of inoculation of histological tumorous tumor material into attempts at experimental alteration of malignancy 364, function of, 240 behavior of, following partial or total removal of parietal portion of tunica vaginalis, 348
- Tetanus, Treatment of, 37 prophylaxis of, 38, actual shock and serum sickness following tetanus antitoxin, 381 vaccination against, 38, present status of treatment of 403
- Therbin, Prolonged administration of to rats and its bearing on reproduction, 339
- Therbin, Prolonged administration of, to rats and its bearing on reproduction, 339
- Theroplasty Non-operative versus operative measures in treatment of pulmonary tuberculosis, 30 in treatment of tunnel chest, 308, 419 versus pneumothorax for pulmonary tuberculosis, 307 in bilateral ca. cross tuberculosis, 308 in treatment of pulmonary tuberculous, 308, 3 4, 418, results of extrapleural in treatment of pulmonary tuberculosis, 418, significance of changes in tissue pressure after in relation to extent of rib removal, 318
- Thorax, Surgical treatment of intrathoracic peritoneal fibrosarcoma, 29, treatment of acute traumatic hemothorax, 20, typhoid of, 97 surgical treatment of funnel, 308, 419, report of Chest Tumor Registry 523
- Thoracic ducts, Diagnostic and therapeutic uses of, 34
- Throat, See Pharynx
- Thrombophlebitis, Thermo-electrical researches regarding surface temperatures of extremities in, 338, blood changes in, and their diagnostic importance, 531
- Thrombosis, Thrombotic of right axillary vein, 341 of veins of lower extremity and pulmonary embolism, 344, 345

- statistics on, covering twenty years, 148, of sigmoid or lateral sinus, 193
- Thymectomy, Influence of, on genetic activity and offspring, 340
- Thymophycin, Action of, on contractions of uterus, 427, results obtained with, in cases of weak labor pains, 438
- Thymus, Relationship between, and genital organs of immature female rabbits treated with pregnancy hormones, 230, clinical implications of, and status thymic lymphaticus, 372, biological effects of extract of, 374
- Thyroid, Histological structure of remaining after cure of Basedow's disease by subtotal thyroidectomy, 21, total removal of, for angina pectoris, 96, 197, content of hormone of, in blood during pregnancy, 124, total ablation of, for congestive heart failure, 197, surgery of, as affected by generalized use of iodized salt in endemic goiter region, 197, transplantation of living grafts of, 198, increasing secretion of milk with anti thyroid protective substances, 233
- Thyroidectomy, Histological structure of thyroid remaining after cure of Basedow's disease by subtotal, 21, total, for angina pectoris, 96, 197, total, for congestive heart failure, 197
- Thyroxin, Use of, in ophthalmology as local agent and metabolic alternative, 298
- Tibia, Autogenous bone pegging for epiphysitis of tubercle of, 141, peg shell formed from bone of, in congenital dislocation of hip, 455, surgical treatment of recent depressed fracture of articular surface of, 556
- Tibial nerve, Malignant tumor of left, 25
- Tidal drainage of urinary bladder as applied to cord bladder, 546
- Tissue cultures, Action of radium on, 264
- Tissue extracts, Use of, for hæmostasis, 478
- Toes, Gangrene of, in polyarteritis nodosa, 144
- Tongue, Radiotherapy of cancer of, 19, sarcoma of, 406
- Tonsil, Radiotherapy of cancer of, 19, 408, 564, treatment of lingual, and lateral pharyngeal bands of lymphoid tissue, 196, anatomical study of peritonsillar spaces, 303, treatment of cancer of, by divided doses of external radiation, 408, 564
- Tracheotomy, Difficulties of removal of cannula following, 95, advantages of high, 509
- Trachoma, Nature of elementary and initial bodies of, 90, etiological diagnosis of conjunctivitis, 298, in British Colonial Empire, 300, relation of, to blindness, 300, existing means of relief of, 300, prophylaxis of, 300
- Transfusion, *See* Blood transfusion
- Trichiasis, Operations for, 17
- Trigeminal nerve, Tumors arising from sensory root of, in posterior fossa, 414
- Trigeminal neuralgia, Bilateral, 202
- Trochlear nerve, Paralysis of, 403
- Tubercle bacillus, Search for, in urine, 136, filterability of virus of, in surgical tuberculosis, 473
- Tuberculin, Treatment of hæmophilia with, 250
- Tuberculosis, Calmette vaccination in prevention of, in childhood, 268, filterability of tuberculous virus in surgical, 473. *See also* names of organs
- Tuberculous rheumatism, 138
- Tularæmia, Consideration of 123 cases of, 475
- Tumors, Action on certain fermentative processes in tissue of, of substances causing hypoglycæmia, 164, results of attempts at experimental alteration of malignancy by inoculation of material of homologous mammalian, 165, classification of, according to radiosensitivity, 263, histological study of myxomata and myxomatoid, 269, influence of pregnancy on growth of, 342, results of arteriography in, 360, constitutional predisposition to, of genital organs in female, 433, Heublein's method of continuous irradiation of entire body for generalized, 468, malignant melanotic, of female genitalia, 540
- See also* names of tumors and organs
- Tunica vaginalis, Clinical and pathological study of fibrosarcoma of, 136, behavior of testicle following partial or total removal of parietal portion of, 348, multiple fibromata of, 440
- Tympanum, Mucopurulent infections of, 18
- ULNA Congenital synostosis of, with radius, 352, painful pronation in young children due to catching of bicipital tuberosity on posterior crest of subsgmoid cavity of, 552
- Ultraviolet light, Treatment of suppurative peritonitis with, 60, action of, in healing of wounds of skin, muscles, liver, and spleen, 256
- Umbilical adenomata, Relationship of so-called, to apocrine sweat glands and adenobrosis of breast, 212
- Umbilical cord, Treatment of Werlhof's disease with serum of, 249
- Umbilical hernia, Multiple ventral hernæ with concomitant strangulated, 110
- Urea, Observations on, in high intestinal obstruction, 32
- Ureter, Relation of physiology of upper urinary tract to elimination urography, 44, effects on upper urinary tract in dogs of incompetent ureterovesical valve, 131, stenoses of, 132, occlusion of, following radium implantation into cervix uteri, 237, new method for complete nephro-ureterectomy for primary tumor of, 347, treatment of bilateral calculi in, 444, dynamic hydro-nephroses and sympathectomy of, 545
- Ureterectomy, New method for complete, for primary tumor of ureter, 347
- Uretero-archoid anastomosis in treatment of hydrocephalus, 203
- Ureterocele, 44
- Ureterodural anastomosis in treatment of hydrocephalus, 203
- Ureterostomy, Cutaneous, in treatment of persistent cystitis after nephrectomy for tuberculosis, 347
- Ureterovesical valve, Effects of incompetent, on upper urinary tract in dogs, 131
- Urethra, Formation of continent, in woman and use of this operation in extrophy of bladder, 39, cancer of, in male, 132, radical curettage of posterior, 238, method of repair of, in complete rupture of, 445, malignant melanotic tumors of female genitalia, 540, experiences and end results in injuries of urinary passages, 547
- Urinary tract, Relation of physiology of upper, to elimination urography, 44, bilharziasis of, 237, etiology of stone formation in, 346, colibacillosis of, 447
- Urine, Search for Koch's bacilli in, 136, prehypophyseal hormones in malignant tumors of uterus, 336, remissions in hyperthyroidism induced by extract of, of pregnancy, 407, melanocyte reaction of preparation of pituitary body and, of cancer patient, 569
- Urography, Relation of physiology of upper urinary tract to elimination, 44, pyelographic injection of perirenal lymphatics, 130, pyelopenstalsis characteristically altered by infection as shown by, 162
- Uterus, Radium therapy in hæmorrhages of, of benign origin, 37, 335, incidence of vaginal fistulæ in patients with carcinoma of cervix of, 37, prolan in treatment of abnormal bleeding of, 37, blood transfusion after hæmorrhages from, 38, active expansion of, according to Sfameni and its value in physiology of pregnancy, 40, pathological anatomy and pathogenesis of œdema of cervix of, during labor, 42, treatment of fibroma of, in absence of pregnancy, 118, endometrial findings in functional menstrual disorders, 120, sensibility of

female lateral genital organs and question of path in gynecological diseases and labor, 1; temperature and vascular reaction in treatment of inflammatory diseases of female genitalia with heat procedures, 23  
 lymphosarcomatosis of female genital organs, 3  
 mucosal anastomosis of bleeding, 235; treatment of prolapse of, 235, 237; spontaneous phlebitis during course of development of myxoma of, 237; prognosis of carcinoma of portio of, 237; youthful, 236; microscopic diagnosis and prognosis in cancer of cervix of, 236, 237; Schüller's test for early squamous-cell carcinoma of cervix of, 236; leucoplakia and cancer of cervix of, 237; iliac lymphadenectomy with irradiation in cancer of cervix of, 237; sarcoma of, 238, 428, relationship between thyroid gland and genital organs of immature female rabbits treated with pregnancy hormones, 211  
 uterine occlusion following implantation of radium in cervix of, 37  
 roentgen therapy of gynecological inflammations, 263  
 treatment of prolapse of, 235  
 radiation treatment of carcinoma of cervix of, 236  
 pre-hypophyseal hormone in malignant tumors of, 236  
 limitations and dangers of application of radium in, in treatment of carcinoma of body of, 236  
 thermoelectrical studies of, 238, postnatal development of, in albino rat, 238, therapy of late puerperal hemorrhage, 241  
 treatment of surgical injuries of following childbirth, 245, action of thyrophysins on contractions of, 437  
 spontaneous rupture of capsule of myxoma of, 427  
 colposcopic diagnosis of carcinoma, 248, sarcoma of, 428, use of prognosis in hypoplasia of, 433, constitutional predisposition to tumors of genital organs in female, 433, retraction of uterus and left parametrium in hypoplasia of genitalia, 434, action of extract of corpus luteum on, of unanesthetized rabbit, 437, action of gonadotropic extracts on movements of of unanesthetized rabbit, 437  
 new actin principle of ergot and its effects on motility of, 437, histological classification of cancers of cervix of, and relation between growth structure and results of radium treatment, 537  
 obstetrical prognosis of large fibrocysts of, 543

**VACCINATION** Anti tetanus, 58, serum shock and serum sickness following, for tetanus and its treatment, 58, prophylaxis of tetanus and serum sickness, 58  
 value of Calmette, in prevention of tuberculosis in childhood, 263  
 of newborn infants, 264  
 in treatment of gonorrhea in female, 433  
 prevention of pulmonary complications in surgery of stomach by pre-operative, 439

**VACCINES** A. toggenus, in psyllophants of pregnancy, 496  
 Vagina, Incidence of fistulae of, in carcinoma of cervix, 37  
 postnatal development of genital organs of albino rat, 238, thermoelectrical studies of, 238, sarcoma of, 428  
 treatment of primary cancer of, 433  
 infection of immature, 437, constitutional predisposition to tumors of, 433  
 radical relief of fistula of, 538, eversion of bladder through fistulous opening in, 538, malignant melanotic tumors of, 540

**Vaccocid**, Treatment of, 59, 547

**Varicose veins**, Comparative value of intravenous sclerosing substances in treatment of, 541  
 treatment of, by preliminary high ligation of internal saphenous vein with injection of sclerosing solutions, 542

**Vascular system**, Early development of, 543

**Vein**, Traumatic thrombosis of right axillary, 54, preliminary high ligation of internal saphenous, with injection of sclerosing solutions in treatment of, aneurysm, 542

**Veins**, Comparative value of intravenous sclerosing substances in treatment of varicose, 541  
 thrombosis of, of lower extremity and pulmonary embolism, 544, 545  
 obstetrical phlebitis of subcutaneous venous septocutaneous type, 54, treatment of, aneurysm, by preliminary high ligation of internal saphenous vein with injection of sclerosing solutions, 545, arteriovenous anastomosis, 496  
 significance of changes in pressure in, after thoracoplasty in relation to extent of rib removal, 518

**Vena cava**, Obstruction of superior, 43  
 surgery of inferior, 563

**Ventricles**, New technique for treatment of traumatic block of, 505  
 dilatations of cavum septi pedunculi and cavum septi, 4

**Vertebra**, See Spine

**Vision**, Relation of trachoma to loss of, 540

**Visual field**, Unilateral central and annular scotoma produced by callosal tract fracture extending into optic canal, 97  
 meningocele attached to nasal part of sphenoid ridge with syndrome of unilateral optic atrophy defect in, of same eye and changes in sella turcica and in shape of interpeduncular cistern after encephalography, 509

**Vocal cords**, Stopping of, 97

**Vocal mechanism**, Vicarious, after laryngectomy, 530

**Voice**, Development of, by laryngectomized persons, 530

**Vomiting**, Prophylaxis of, pregnancy, 216

**Valve**, Treatment of peristaltic prisms of, 431

**WATER**, Observations on, with regard to cause of death in high intestinal obstruction, 211  
 balance of, in surgical conditions, 37, absorption of, by small intestine and colon, 50  
 influence of deprivation of, on development of shock, 37  
 treatment of acute and chronic cases of cerebral trauma by methods of dehydration, 42

**Werdnig's disease**, Treatment of, with neoplasectomy, 449

**Whale oil**, Treatment of wounds by local application of, 253  
 Experimental studies of healing of, 145, results of experimental treatment of infected, 249  
 treatment of by local application of whale oil, 255  
 action of ultraviolet rays on healing of, 506  
 importance of bacteria in surgical infections, 251  
 treatment of pyogenic surgical diseases with artificial gastric juice, 57  
 post-operative emaciation, 564, complications in operative, 564, treatment of, with cod liver oil ointment, 461

**Wrist**, Malunion of scaphoid bone of, 50, treatment of fractures of scaphoid bone of, 42  
 necrosis of scaphoid bone of, 449  
 condensation of scaphoid bone of, 539

**X-RAY**, See Roentgen ray

## BIBLIOGRAPHY INDEX

### SURGERY OF THE HEAD AND NECK

Head, 64, 160, 273, 376, 480, 574  
 Eye, 64, 160, 273, 376, 480, 574  
 Ear, 63, 170, 274, 377, 481, 575  
 Nose and Sinuses, 65, 170, 274, 377, 481, 575  
 Mouth, 66, 171, 274, 378, 482, 576  
 Pharynx, 66, 171, 275, 378, 482, 576  
 Neck, 66, 171, 275, 378, 482, 576

### SURGERY OF THE NERVOUS SYSTEM

Brain and Its Coverings, Cranial Nerves, 67, 172, 276, 379, 483, 577  
 Spinal Cord and Its Coverings, 68, 173, 270, 379, 484, 577  
 Peripheral Nerves, 68, 173, 277, 379, 484, 577  
 Sympathetic Nerves 68, 173, 277, 380, 484, 578  
 Miscellaneous 68, 380, 484

### SURGERY OF THE THORAX

Chest Wall and Breast 68, 173, 277, 380, 484, 578  
 Trachea, Lungs, and Pleura, 68, 173, 277, 380, 485, 578  
 Heart and Pericardium, 69, 174, 278, 381, 485, 579  
 Esophagus and Mediastinum, 69, 174, 278, 381, 485, 579  
 Miscellaneous, 70, 174, 278, 381, 485, 579

### SURGERY OF THE ABDOMEN

Abdominal Wall and Peritoneum, 70, 175, 278, 382, 486, 579  
 Gastro-Intestinal Tract, 70, 175, 278, 382, 486, 579  
 Liver, Gall Bladder, Pancreas, and Spleen 73, 177, 280, 384, 488, 582  
 Miscellaneous, 74, 178, 281, 383, 489, 583

### GYNECOLOGY

Uterus, 74, 178, 282, 385, 489, 583  
 Adnexal and Peruterine Conditions, 75, 179, 282, 386, 490, 584  
 External Genitalia, 75, 179, 283, 387, 491, 585  
 Miscellaneous, 75, 179, 283, 387, 491, 585

### OBSTETRICS

Pregnancy and Its Complications, 76, 181, 284, 388, 492, 586  
 Labor and Its Complications, 76, 181, 285, 389, 494, 587  
 Puerperium and Its Complications, 77, 182, 286, 390, 494, 588  
 Newborn, 77, 182, 286, 390, 494, 588  
 Miscellaneous, 77, 182, 286, 391, 495, 588

### GENITO URINARY SURGERY

Adrenal, Kidney, and Ureter, 78, 182, 287, 391, 495, 588  
 Bladder, Urethra and Penis, 79, 183, 287, 391, 495, 589  
 Genital Organs, 79, 183, 288, 392, 496, 589  
 Miscellaneous, 79, 184, 288, 392, 496, 590

### SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

Conditions of the Bones, Joints, Muscles, Tendons, Etc 80, 184, 288, 392, 497, 590  
 Surgery of the Bones, Joints, Muscles, Tendons, Etc, 82, 185, 290, 394, 498, 591  
 Fractures and Dislocations, 82, 186, 290, 394, 499, 592  
 Orthopedics in General, 83, 187, 292

### SURGERY OF THE BLOOD AND LYMPH SYSTEMS

Blood Vessels 83, 187, 292, 395, 500, 593  
 Blood, Transfusion, 84, 187, 292, 396, 500, 593  
 Reticulo-Endothelial System, 84, 187  
 Lymph Glands and Lymphatic Vessels, 84, 187, 292, 396, 500, 593

### SURGICAL TECHNIQUE

Operative Surgery and Technique, Postoperative Treatment, 84, 188, 293, 396, 500, 594  
 Antiseptic Surgery, Treatment of Wounds and Infections, 85, 188, 293, 397, 501, 594  
 Anesthesia, 85, 188, 294, 397, 501, 595  
 Surgical Instruments and Apparatus, 86, 189, 294, 398, 501, 595

### PHYSICO-CHEMICAL METHODS IN SURGERY

Röntgenology, 86, 189, 294, 398, 502, 595  
 Radium, 87, 189, 295, 398, 502, 596  
 Miscellaneous, 87, 189, 295, 398, 502, 596

### MISCELLANEOUS

Clinical Entities—General Physiological Conditions, 87, 190, 295, 399, 502, 596  
 General Bacterial, Protozoan, and Parasitic Infections, 88, 191, 296, 400, 504, 597  
 Ductless Glands, 88, 191, 296, 400, 504, 598  
 Surgical Pathology and Diagnosis, 88, 192, 296, 504, 598  
 Experimental Surgery, 192, 504  
 Hospitals, Medical Education and History, 192, 598





## AUTHOR INDEX

- [illegible]



- Lenggenhager, K, 460  
 Lenormant, C, 424  
 Lenz, M, 199  
 Leon, J, 438  
 Lepper, E H., 517  
 Leriche, R., 442, 567  
 Le Roy, C. M., 137  
 Leucutua, T, 252  
 Leveuf, J, 558  
 Levin, L, 517  
 Leviskaia, M K, 38  
 Levy, 235  
 Lévy, A., 457  
 Lewis, D, 104  
 Lexer, E., 149  
 Ley, A., 24  
 Lieber, H., 366  
 Lilie, W L., 92  
 Linde, F, 553  
 Liou, D, 236  
 Lissner, H., 510  
 Livingston, E M., 366  
 Livingstone, H, 159  
 Lloyd Davies, O V., 529  
 Llusia, J B., 541  
 Lob, 370  
 Lob, A., 469  
 Loehr, W., 98, 461  
 Logróscino, D., 451  
 Loré, J M., 97  
 Loudenslager, P E., 297  
 Louste, A., 416  
 Louyot, J, 128  
 Lowsley, O S., 538  
 Lozano, R., 115  
 Lucarelli, G, 217  
 Lucchese, G, 349  
 Lucinisco, E, 567  
 Lukacs, M., 427  
 Lumsden, T, 269  
 Lunardi, B., 242  
 Lund, C C., 94  
 Lyle, T K., 93  
 MacCallan, A F., 300  
 MacComb, W S., 468  
 MacDonald, D., 264  
 Macé, M., 516  
 Mach, R., 551  
 MacKenty, J E., 200  
 MacKenzie, D W., 135  
 Mackey, W A., 223  
 Macklin, M T., 569  
 MacMahon, H E., 448  
 Macmillan, S F., 44  
 MacNeal, W J., 373, 406  
 Macne, J P., 507  
 Macrae, T F., 269  
 Maddock, W G., 57, 248  
 Madruza, G, 124  
 Maes, U., 20, 364  
 Mahon, R., 542  
 Mahorner, H, 54  
 Maljsev, B, 55  
 Malniak, J W., 206  
 Mamou, H., 107  
 Manzi, 434  
 Marill, R., 31  
 Manon, G, 39, 445  
 Marsálek, J, 437  
 Marsella, A, 134  
 Martin, C. L., 564  
 Martin, H. E., 408, 564  
 Martin, J M., 564  
 Martin, W J., Jr., 326  
 Masciottra, R. L., 224  
 Masmonteil, F, 557  
 Massart, R., 356  
 Masselot, F, 350  
 Matheson, N M., 45  
 Mathieu, J, 225  
 Matolay, G, 373  
 Mauro, M., 50, 323, 430  
 Maxwell, J P., 549  
 Mayer, 43  
 McClure, R. D., 197  
 McCoy, H A., 265  
 McCurdy, G A., 236  
 McFetridge, E M., 20, 364  
 McGaw, W H., 138  
 McIntosh, H C., 264  
 McKissock, W, 329  
 McLaughlin, C, 364  
 McNattin, R. F., 408  
 McWhorter, G L., 34  
 Meigs, J V., 37  
 Meillère, J, 161  
 Menegaux, G, 366, 554  
 Mentzer, S H., 31  
 Mercier, O, 337  
 Meyer, G, 254  
 Michon, P, 128  
 Miescher, G, 564  
 Mikkelsen, O, 116  
 Milch, H., 50, 52  
 Milkman, L A., 245  
 Miller, R H., 463  
 Milligan, E T C., 330  
 Mintz, E R., 45  
 Mitchell, A. G., 372  
 Mitchell, G A G., 423  
 Mitsui, K., 230  
 Mixter, C G., 197  
 Mockett, P, 228  
 Moersch, F P., 414  
 Molesworth, E H., 59  
 Mollo, L, 449  
 Moloy, H. C., 119, 343  
 Monod, R., 108  
 Monroe, R. T., 525  
 Montemartini, G, 362  
 Montgomery, J B., 38, 119  
 Moore, C R., 539  
 Moore, J J., 245  
 Moore, J M., 53  
 Morgan, C N., 330  
 Morgan, T N., 537  
 Morson, A C., 44  
 Mosinger, M, 98  
 Moszkowicz, L., 135  
 Moukharmsky, A., 44  
 Moulouquet Doléris, P, 26  
 Muir, E G., 426  
 Muncie, W, 255  
 Munro, D, 546  
 Murray, C R., 52  
 Murtagh, B L S., 197  
 Myers, D, 195  
 Naush, A E., 412  
 Nathanson, L, 198  
 Naujoks, H., 335  
 Naulleau, J, 360  
 Navratil, E, 428  
 Neuhof, H., 316  
 Neustaedter, M., 514  
 Neuwanger, C H., 131  
 Neuweiler, W, 124  
 Nicholson, G W., 568  
 Nicholson, M M., 268  
 Nogara, G, 214  
 Nordenson, N G., 55  
 Nordland, M., 33  
 Nordlund, U, 213  
 Norrander, E, 524  
 Norris, S, 37  
 North, J P., 562  
 Noszkay, A von, 443  
 Novak, E, 337  
 O'Brien, C S., 506  
 Ochsner, A., 54, 318  
 Odasso, A., 61  
 O'Day, K., 17  
 Odiette, D, 554  
 Ogilvie, W H., 526  
 Olivecrona, H., 100  
 Oliver, R L., 406  
 Olivier, H, 161  
 Oppenheimer, B S., 235  
 Oppenheimer, G D., 346  
 Ormerod, F C., 201  
 O'Shaughnessy, L, 320, 566  
 Osmond, L H., 308  
 Ostrowski, T, 414  
 Oury, P, 572  
 Overholt, R H., 105, 318, 518  
 Owens, N, 318  
 Owings, J C., 198  
 Packalén, T, 230  
 Pagliani, F, 222  
 Paillas, J E., 321, 413  
 Pampari, D, 110  
 Parda, R., 202, 308  
 Pares, L, 552  
 Parker, F, Jr., 473  
 Parkinson, J, 196  
 Paroli, G, 121  
 Paschoud, H, 60  
 Patel, J, 424  
 Patey, D H., 223  
 Patrassi, G, 161  
 Patton, H., 407  
 Paul, R G., 223  
 Paulian, D, 550  
 Pazzagli, R., 416, 562  
 Pearson, C F., 207  
 Peckham, C H., 541  
 Peet, M M., 203, 414  
 Pendergrass, E P., 411  
 Perslow, O, 520  
 Perussia, F, 19  
 Peterson, L., 112  
 Petré, G, 108  
 Peyton, W T., 52  
 Pfahler, G E., 268, 405, 417, 512, 546  
 Phaneuf, L E., 37  
 Phemister, D B., 159, 455  
 Phillips, G, 99  
 Pi, H T., 507  
 Piccagli, G, 54  
 Piccunino, G, 330  
 Piergrossi, A., 217  
 Pigeaud, H, 127  
 Pilcher, L S., 2nd, 518  
 Pilloni, S, 543  
 Pohl, H., 459  
 Poinso, R., 321  
 Politis, A M., 556  
 Ponzi, E, 234  
 Porritt, A. E., 154  
 Pottenger, F M., 26  
 Potter, A. L., 229  
 Pou, M B., 306  
 Prather, G C., 346  
 Prey, D, 106  
 Price, L W., 166  
 Priwes, M G., 442  
 Prussia, G, 473  
 Puccioni, L, 227  
 Puech, P, 23, 307  
 Quimby, E H., 368  
 Quix, F H., 95  
 Rabboni, F, 235  
 Rabin, C B., 316  
 Ragnotti, E, 346  
 Rahm, H., 449  
 Raiga, A., 463  
 Raismann, V, 52  
 Rammstedt, C, 324  
 Ramsay, A. M., 505  
 Rankin, F W., 326, 531  
 Ratner, M., 135  
 Raven, R W., 320  
 Reay, E R., 348  
 Reboul, H., 558  
 Redi, R., 235  
 Reggiani, M., 348  
 Reichenbach, E, 194  
 Reid, M R., 144, 361  
 Repetto, E, 213, 256  
 Reuter, J, 302  
 Riba, L W., 237  
 Ricard, E, 527  
 Richard, A., 350  
 Riehoff, F, Jr., 108  
 Rigler, L G., 523  
 Rihmer, B von, 444  
 Rondone, A., 533  
 Ringer, P H., 314  
 Ritter, C, 257  
 Rø, J, 458  
 Robb, D., 242  
 Roberts, R E., 40  
 Roberts, S R., 162  
 Robertson, H. E., 148  
 Robertson, J P., 47  
 Robinson, L., 435  
 Rodger, T R., 18  
 Roederer, C., 350  
 Roger, H., 413  
 Rogers, G, 537  
 Rogers, H., 463  
 Rogers, W A., 555  
 Rohde, W, 307

- Rohrer C  
 Romani, A. 32  
 Roosh, R. 467  
 Rose, J. C. 406  
 Rossi, C. 478  
 Roodil, G. 14  
 Roosen, J. 48  
 Roussy G. 21, 98  
 Rowntree, L. G. 374  
 Rubinfeld, R. 30  
 Rubinstein, H. S. 45  
 Rueckart, W. 57  
 Russell, D. 67  
 Russell, W. R. 3  
  
 Ruto, M. 475  
 Salasche, L. G. 15  
 Salama, A. 303  
 Salama, A. 343  
 Sampson, J. A. 335  
 Sano, S. 32  
 Sano, E. 42, 24  
 Santos d'Aradon, A. 370  
 Sarroide, S. 6  
 Sasso, E. 358  
 Sarnadens, J. T. 554  
 Savre, L. 475  
 Scaglietti, O. 354  
 Scherer, H. 54, 153  
 Scherer, W. 30  
 Schepers, C. 456  
 Schwaefler, C. 43  
 Schwaefler, G. C. 433  
 Schukit, E. 534  
 Schukit, A. 5  
 Schukit, H. B. 343  
 Schukit, E. R. 5  
 Schukit, M. T. 95  
 Schuch, E. 31  
 Schoenberg, M. J. 95  
 Schaubert, E. von. 504  
 Schmitt, H. P. 407  
 Schumacher, S. 450  
 Schuster, W. 30, 543  
 Schwartz, A. 555  
 Schneur, G. 38  
 Scott, R. K. 55  
 Scott, S. 30  
 Secherre, L. 500  
 Secherre, J. 551  
 Secherre, G. 38  
 Secherre, J. E. 44  
 Seiderhoff, G. 449, 444  
 Seiderhoff, M. G. 35  
 Seigrist, L. 7  
 Seiver, J. W. 555  
  
 Sevringhaus, E. L. 341  
 Seydel, S. 42  
 Sharpe, W. C. 379  
 Shaw, W. F. 335  
 Shepley, A. E. 372, 406  
 Short, A. R. 3  
 Shumacher, H. B. J. 375  
 Siegel, J. 333  
 Siegmund, H. 430  
 Simpson, R. 35  
 Sise, L. F. 59  
 Sjostrom, T. 134  
 Sjovall, A. 32  
 Skipper, L. 309  
 Skindina, G. 143  
 Skone, D. 566  
 Smart, Sir M. 15  
 Smolik, K. 417  
 Smith, A. J. D. 32  
 Smith, P. R. 37  
 Smith, G. O. 45  
 Smithwick, R. H. 249  
 Smolekoff, J. W. 8  
 Solano, A. 38  
 Sonntag, E. 154  
 Soto-Hall, R. 142  
 Souitar II S. 319  
 Spachman, E. W. 51  
 Spencer, M. F. 573, 406  
 Spengler, W. 90  
 Sporn, R. 470  
 Staley, R. W. 8  
 Stafford, H. B. 404  
 Vander, H. J. 343  
 Starr, P. 407  
 Starr, P. H. 577  
 Sterle, B. F. 460  
 Steinberg, M. E. 307  
 Stern, E. L. 44  
 Stewart, W. H. 335  
 Stier, E. 307  
 Stillman, N. 464  
 Stromer, B. B. 147  
 Stone, C. S. J. 589  
 Stone, H. B. 98  
 Stout, A. P. 99  
 Strauss, A. F. 548  
 Stahl, L. 4, 307  
 Stumpf, P. 568  
 Sturis, L. 28  
 Sudra, C. V. 6  
 Sudra, F. 133  
 Suetell, W. D. 460  
 Swana, L. T. 448  
 Symons, D. 366  
 Szwarc, S. 32  
  
 Tabanelli, M. 57  
 Takano, M. 410  
 Tama, D. 36, 423  
 Tamovata, S. 43  
 Tala, G. 54  
 Tanning, J. 7  
 Taylor, H. E. 98  
 Taylor, H. M. 30  
 Tenet, M. S. 46  
 Thayer, T. E. H. 530  
 Thodouren, D. 305  
 Thodouren, A. A. 240  
 Thomas, C. P. 308  
 Thymosa, P. 90, 308, 390  
 Tidy, H. 300  
 Tocaime, L. M. 363  
 Tod, M. C. 31  
 Todd, A. H. 454  
 Toomoff, A. S. W. 560  
 Trausa Rao, G. 25, 36, 335, 34  
 Trip, J. 433  
 Trubet, J. 456  
 Tromdale, P. E. 522  
 Tucker, O. 51  
 Todkora, O. R. 128  
 Turpitt, A. 3  
 Turrell, W. J. 505  
 Tuttle, W. McC. 316  
  
 Uhle, C. A. W. 3  
 Ullrich, F. 3  
 Umanova, R. 309  
 Urcary, L. 306  
  
 Valenzuela, J. R. 6  
 Valerick, R. 218, 228  
 Vance, B. M. 44  
 Van der Linden, P. 350  
 Van Haelst, W. 4, 8  
 Van Poesse, G. McC. 23  
 Vastros, J. H. 368, 417  
 540, 549  
 Vaughan, K. 40  
 Vana, V. 309  
 Vargas, C. 527  
 Vermorel, V. 3  
 Victor, J. 363  
 Villaral, P. V. 300  
 Valgren, R. R. 8  
 Vixier, V. 33  
 Volcker, F. 30  
 Vora, H. C. 414  
 Vora, J. 7  
 Wade, V. J. 579  
  
 Walker, A. E. 301  
 Wallace, H. L. 220  
 Wallart, J. 429  
 Wallgren, A. 368  
 Wallis, O. 432  
 Walters, W. 30  
 Walther, O. 173  
 Warburton, H. J. 368  
 Waters, R. M. 51  
 Watson, B. P. 343  
 Watson, E. M. 445  
 Watson-Williams, E. 2  
 Webb-Johnson, A. E. 4  
 Weddel, A. G. 64  
 Weiss, A. 220  
 Weiss, H.  
 Weninger, K. 126  
 Wetzel, P. 126  
 Whitt, L. R. 320  
 Wharton, L. R. 444  
 White, J. C. 549  
 Widenberg, H. 37  
 Wiesner, B. P. 338  
 Widet, R. M. 30  
 Wiles, P. 353  
 Wilkins, W. R. 122  
 Willis, R. A. 474  
 Wilson, J. 505  
 Windfield, F. 558  
 Wirtz, H. 309  
 Wisbrun, W. 244  
 Wittelsch, P. 369  
 Wolfe, J. M. 127  
 Wolff, J. A. 128  
 Wolgast, J. 36  
 Wolzmann, H. W. 515  
 Wernack, M. A. 318  
 Wood, G. H. 303  
 Wood, H. G. 7  
 Woods, R. C. 368  
 Woods, R. S. 585  
 Wright, O. 124  
 Wright, L. T. 93  
 Wright, R. D. 17  
  
 Young, A. G. 428  
 Young, H. H. 446  
  
 Zadeh, I. 451  
 Zampetta, M. 51  
 Zanardi, F. 7  
 Zepardo de Amoral, E.  
 Zolinger, R. 550  
 Zolotarev, A. 31  
 Zornig, G. 306  
 Zuppinger, A.

